Albuquerque Tricentennial

Fourth Grade
Teachers Resource Guide

September 2005

I certify to the king, our lord, and to the most excellent señor viceroy: That I founded a villa on the banks and in the valley of the Rio del Norte in a good place as regards land, water, pasture, and firewood. I gave it as patron saint the glorious apostle of the Indies, San Francisco Xavier, and called and named it the villa of Alburquerque. -- Don Francisco Cuervo y Valdes, April 23, 1706

Resource Guide is available from www.albuquerque300.org

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My City of Mountains, River and Volcanoes

Albuquerque Geology

In the dawn of geologic history, about 150 million years ago, violent forces wrenched the earth's unstable crust. In some places heat melted underlying rock, which burst to the surface as volcanoes. In other places, mountains rose, but thousands of years of erosion by wind, rain and snow would wear them down.

Sandia Mountains

Here, in Precambrian time, the underlying rock didn't break to the surface but instead cooled and solidified to form granite. Later, stresses moved and lifted the granite up, breaking it into blocks. This formed the core of the Sandia Mountains.

About 300 million years ago, great inland seas began to cover the area and then retreat. The waters carried suspended sediments as well as marine life. When they retreated, they left behind layers of limestone, sandstone and shale, which capped the Precambrian rock. This is why you can see marine fossils in the limestone caprock of the Sandias. At times exposed land would be subject again to erosion before dropping again beneath the water, which then continued to add deposits. This process went on for hundreds of millions of years.

Around 70 million years ago, in the late Cretaceous Period, there was an upheaval of the earth's crust, which pushed up the Rocky Mountains, including the Sangre de Cristos, which are the southernmost extension of the Rockies.

About seven to ten million years ago, heat and compression broke the earth's shell, causing a crack, or fault. On one side of the fault, the earth rose sharply, creating a sheer bluff that faced west. This exposed layers of rock deposited in previous ages, along with the Precambrian granite. (Imagine breaking a birthday cake in half, and tilting one side up to reveal the layers.) Geologists estimate that the total vertical rise of the fault is about five miles. The same rocks we see on top of Sandia Crest are also miles below the surface.

Erosion began wearing away the layers and rock, creating the Sandias and the Manzanos as we know them. The Sandias and Manzanos are not part of the Rocky Mountains because they formed much later and by a different process.

Today the Sandias have two distinct peaks – North Sandia Peak, 10,678 feet, and South Sandia Peak, 9,782 feet. In between is a saddle known as Sandia Crest. The knobs, columns and pinnacles you can see on the western side were created by erosion, which also created canyons. Runoff from these canyons feeds arroyos that have cut through the East Mesa.

The Sandias are about 20 miles long and end in the south at Tijeras Canyon. "Tijeras" means "scissors" in Spanish. Here, various companies have made cement from the limestone, dolomite, shale and gypsum since 1957.

How did the Sandia Mountains get their name? The usual story is that early Spanish settlers named the mountains "sandia," for "watermelon." However, the range actually got its name from Sandia Pueblo, according to historian Joseph Sanchez. As early as 1611 Spanish frontiersmen and missionaries referred to it as "La Sierra de Sandia," or Sandia's mountain.

Rio Grande Rift

As granite blocks rose to create the Sandias, the land west of the fault dropped, leaving a depression called a rift. Similar movements created a string of depressions from southern Colorado to northern Mexico called the Rio Grande Rift. In the Albuquerque area, the Rio Grande Rift Valley is about 30 miles wide, with one fault at the base of the Sandia Mountains and the other fault to the west near the Rio Puerco. It's one of the few young continental rift valleys on the planet. A rift is a place in the Earth's crust, where the crust is thinning and pulling apart.

This rising and falling took place slowly, and continues to this day. The Sandias and Manzanos continue to rise, and the valley continues to drop.

Albuquerque's Aquifer

Over time the rift filled with sand, gravel, silt, clay and rocks carried by water, gravity and wind from nearby mountains. This porous material reached 10,000 feet deep, and it has collected water for thousands of years. That means that when you drink Albuquerque water, you're drinking water that may be thousands of years old.

The City of Albuquerque has relied on this store of water, called an aquifer, for over a century. For some time the city has been pumping this groundwater from the aquifer faster than it can be recharged through precipitation. This is called "mining" the water. For that reason, the City is building facilities to use the Rio Grande for drinking water.

Rio Grande

During the Ice Age, sheets of ice extended south from the North Pole. They didn't reach this area, but mountain glaciers formed in the high mountains. As the climate warmed, these glaciers moved and melted, expanding valleys and carving channels for rivers as they progressed.

High in the Colorado Rockies, melting glaciers fed a powerful stream, which pushed south toward the sea, carrying rock and earth with it. At present-day Albuquerque the river filled in the Rio Grande Rift with sediment and then began to erode the river bed it had just created, carrying debris downstream. The river's cycle of deposits and erosion has continued now for thousands of years and is still in progress.

Until recent years, the river meandered over a wide floodplain, depositing silt. As the riverbed rose, the Rio Grande would break out of its channel and take a new path.

Pueblo people learned to live with the meandering river, but as Spanish settlers established farms along the river after 1598, flooding became a problem. In addition, the river created mud flats, marshes and ponds, and quicksand was a danger when crossing the river in certain places. But anyone wanting water had only to dig a few feet.

The untamed Rio Grande vexed the city until organized efforts at flood control began in 1925 with the creation of the Rio Grande Conservancy District. In time a

network of dams, drains and diversion channels confined the Rio Grande and stopped its meandering. Drought and increasing use of wells lowered the water table and eliminated the swamps.

Volcanoes

About 150,000 years ago – just yesterday in geologic time – a north-south fracture opened west (in the middle of the rift) and nearly parallel with the river. Lava exploded from multiple places along the faults because the Earth's crust was thinner and the magma was closer to the surface. At six of these places, lava and ash would form volcanic cones. From these, lava bubbled and spread towards the river, hardening into a cap of basalt.

Within the last 100,000 years, the softer alluvial soils began to erode from underneath the basalt, and the layer of basalt tumbled down in boulders along an edge, or escarpment.

Today we can see five volcanic cones. They are, from south to north, the J A, Black, Vulcan, Bond and Butte. J A probably stands for John Adams School, whose students first painted letters on the volcano. Later students from St. Joseph's College continued painting a solitary J on Vulcan. Black and Bond are named for the Black family and Frank Bond, who owned land nearby. A sixth volcano disappeared because it was mined for scoria, small pieces of reddish lava rock. (The other type of volcanic rock is basalt, which is black.)

Resources:

www.aps.edu/aps/wilson/AlbuquerqueGeology/

www.NMnaturalhistory.org

Albuquerque's Environmental Story: http://www.cabq.gov/aes/

Bauer, Paul and others. Albuquerque: A guide to its Geology and Culture.

Friends of the Rio Grande Nature Center. The Bosque Education Guide.

Julyan, Robert and Stuever, Mary. Field Guide to the Sandia Mountains.

Simmons, Marc. Albuquerque: A Narrative History.

Lesson Plan: Albuquerque Geology
Albuquerque in 3D
By Jachalyn Esra

New Mexico Standards
Social Studies: II-A1-3, II-B1-2
Mathematics: II-C3, II-D1-4, IV-A2
Language Arts: I-A3, I-B2, I-D5, II-A1-4, II-B9, II-C1

Objective: Students will identify and illustrate basic physical features and landforms of the region.

Grade: 4th

Group Size: 25 (pairs and smalls groups of 4 to 5 students)

Duration: 4 to 5 class periods

Setting: Classroom

Activity 1: Identifying Land Forms

Materials:
- Computers with Internet access
- Reference materials (atlases, maps, and nonfiction books)
- Poster board
- Markers, colored pencils
- Drawing paper

Setup & Preparation:

Procedure:
1. Brainstorm the area's physical features and land forms. Determine which features and land forms are found in the Middle Rio Grande Valley, the area in and around Albuquerque.

2. Divide students into small research groups. Assign each group a feature or land form to research. (Suggested topics include the Sandia Mountains, Rio Grande River, Albuquerque volcanoes, alluvial fans, valley, West Mesa, foothills-uplands and Rio Puerco River.) Reports must include a definition, picture, elevation(s), and map. Students may use atlases, the Internet, or other class resources. Findings are to be displayed on a poster.

3. Allow students time to research and prepare posters. Circulate among the groups to answer questions or facilitate.

4. Have students share their findings. Display posters for use in Activities 2 and 3.

Activity 2: Landform Models

Materials:

Research posters
Pictures of land forms
Paper plates
Shaving cream
Paper towels

Procedure:

1. Review land form definitions and pictures.

2. Divide students into pairs. Distribute paper plates, paper towels and shaving cream.

3. Have students demonstrate each feature using their hands and then construct a shaving cream model.

4. Circulate among the groups to observe their models.

[Shaving cream activity adapted from the Florida Geographic Alliance's collection of lesson plans, "Shaving Cream Landforms" by Karen Futornick]

Activity 3: Making a Relief Map

Materials:

- Research posters
- Pictures and diagrams of the area
- Poster board
- Project sheets
- Heavy cardboard (one piece per group)
- Colored pencils, markers
- Paint, brushes
- Toothpicks
- Labels
- Plastic knives
- Salt dough (mixing bowl, flour, salt, measuring cup, large spoon, water)

Set-up:

1. Collect pieces of cardboard such as pizza box or side of heavy cardboard box.
2. Prepare salt dough. Mix 9 cups flour and 3 cups salt. Gradually add 3 cups of water. Mix until dough is the consistency of paste or cookie dough. You may have to make more dough depending on the number of groups.
3. Create a poster of suggested roles for group members: materials manager, researcher, map builder, legend maker, mathematician, painter and label maker.
4. Copy project sheet.

Procedure:
1. Divide students into small groups. Hand out at least two different diagrams of the Rio Grande Rift. Have each group outline and label the land regions. Ask students what they notice about the diagrams. How are they alike and different?
2. Explain that students will be using these diagrams to create a three-dimensional view of the Rio Grande Valley near Albuquerque. Hand out the project sheet and go over the instructions. Answer questions before allowing groups to begin. (Be sure to review the terms *relief map, map legend*, and *compass rose*.)
3. Allow students time to determine each member's role before beginning the project.
Note: Students will need one period to build the map and another to paint. Maps must air dry and may take 2-3 days to dry depending on the thickness.
4. When maps are completed, bring the class together to discuss the project. What worked? What did not work well?
5. Display relief maps.

Assessment: Students will be evaluated on class participation, small group work, and group relief maps.

Class Participation Rubric*

5 points	4 points	3 points	2 points	1 point
Well prepared for class, attempts to answer questions and adds relevant outside information. Makes excellent use of time	Prepared for class, attempts to answer questions. Makes good use of time	Occasionally not prepared for class, listens but does not volunteer. At times interrupts or talks.	Often not prepared for class, does not listen. Gives up easily, not engaged.	Rarely prepared, minimal or no participation. Disrupts, not on task.

Small Group Rubric

4 points	3 points	2 points	1 point
Outstanding effort and contribution to project. Demonstrates full understanding and use of key ideas and concepts. Recorded work clear and well organized.	Good effort and contribution to project. Demonstrates essential understanding of the key ideas and concepts. Recorded work mostly accurate and appropriate.	Fair effort and contribution to project. Demonstrates partial but limited understanding of key ideas and concepts. Recorded work may be incomplete, misdirected or unclear.	Minimal effort and contribution to project. Demonstrates little or no understanding of the key ideas and concepts. Recorded work is difficult to understand.

[adapted from www.bconney.net/]

Relief Map Rubric

	4 points	3 points	2 points	1 point
Group Work	Each member was responsible for his/her duties. All performed exceptionally well.	Each member was responsible for his/her duties. All or most members performed well.	Some members were responsible for their duties. Some performed satisfactorily; others did not.	Few or no members were responsible for their duties. Performance was minimal.
Accuracy	Finished map precisely represents mountains, uplands, valley, river, mesa, alluvial fans, and volcanoes. Elevations are accurate.	Finished map represents mountains, uplands, valley, river, mesa, alluvial fans, and volcanoes. Elevations are accurate.	Finished map represents large landform shapes. Some landforms or features are misshapen or out of place.	Landforms or features are misshapen, out of place. Some features are missing.
Quality	Finished map shows creativity and visual appeal. Colors accurately indicate elevation. Map is neat and sturdy.	Finished map uses color to indicate elevation. Map is neat and sturdy.	Finished map resembles the shape of the region. Work lacks neatness.	Map is incomplete and lacks neatness.
Labeling	Map has a title, legend, scale, and compass rose. Color key is accurate. Elevation scale is consistent. Labels are neat and spelled correctly.	Map has a title, legend, scale, and compass rose. Color key is accurate. Elevation scale is consistent. All features are labeled.	Most features are labeled. Legend or elevation scale may be inconsistent.	Few or no features are labeled. Legend or scale is missing.

Extensions:

1. Create a PowerPoint land form dictionary using clip art.
2. Create a collage of the various land forms using pictures from magazines, newspapers, or clipart.
3. Sketch a land form near the school.
4. Draw a picture of two different land forms. Write a story or poem to go with the picture.
5. Write step-by-step directions on how the relief map was completed.

Resources

Books

New Mexico Road & Recreation Atlas. Benchmark Maps. 2002.
The Road of New Mexico. Shearer Publishing. 1990.

Maps/Diagrams

View of Albuquerque from space
http://terraserver-usa.com
Albuquerque's Hydrologic Cycle (cross-section view of Rio Grande valley)

http://www.cabq.gov/aes/

Albuquerque Natural Features (diagram of land formations)
http://www.cabq.gov/aes
Albuquerque, Rio Grande view from space (NASA)
http://earth.jsc.nasa.gov/sseop/efs/geon.htm
Menaul Section of the Albuquerque Aquifer
http://www.cabq.gov/watrconservation/insert.html
New Mexico landform atlas (shaded relief map, satellite image)
http://fermi.jhuapl.edu/states/
New Mexico map (printable state maps from 50 states)
http://www.50states.com/maps/
New Mexico map (printable state maps from National Geographic)
http:www.nationalgeogrpahic.com/expeditions/atlas/index.html
New Mexico relief maps (available from Textbook Depository)
New Mexico topographic maps
http:///sar.lanl.gov/topo_maps/
Search and rescue maps provided as a public service by Los Alamos National Laboratory
New Mexico topographical map (color maps from National Geophysical Data Center)
http://www.ngdc.noaa.gov/mgg/topo/state.html
Rio Grande Rift (cross-section diagram of Rio Grande Valley)
http://www.cabq.gov/aes/

Web Sites

Albuquerque Volcanic Field (photos and brief description)
http://volcano.und.nodak.edu/vwdoc/volc_images/north_america/albu.html)
Albuquerque's Environmental Story
http://www.cabq.gov/aes/
Enchanted Learning (Illustrated Glossary of Landforms and Bodies of Water)
http:www.enchangedlearning.com/geography/landforms/glossary.shtml
Houghton Mifflin GeologyLink (virtual field trip links)
http"///college.homco.com/geology/resources/feologylink/fieldtips/natrips/us_west.html)
Landforms (photographs of landforms to make a PowerPoint dictionary)
http://www.homestead.com/mrspeimann/Landforms~ns4.html
Sandia Mountains (photos and brief descriptions)
http://www.cybergata.com/sandia.htm

Field Trips/Trunk Shows

Volcanoes
Open Space Division
Parks and Recreation
P.O. Box 1293
Albuquerque, NM 87103
505-452-5210

Site is managed by the National Park Service and is accessible from I-40, approximately 4.8 miles north of exit 149 (Paseo del Volcan).

Middle Rio Grande Valley
Relief Map Project

Materials

1 piece of heavy cardboard
Paints
1 ½ cups of salt dough
10 labels
Pencils
Markers
Paint brushes
10 toothpicks
Plastic knives
Diagrams of the region

Directions:

1. Collect all materials.
2. Locate the features to represent on your model. Make a list of each feature.
   a) Have the label maker create a label for each feature. Attach the labels to the toothpicks.
   b) Have your researcher make a list of the elevations for each feature. Determine the range of elevations to represent on your model.
   c) Decide on a scale you will use.
   (For example 1 inch = 10,000 feet or 1 cm = 1, 000 meters.)
   d) Have your mathematician calculate the heights of the map's features.
   e) Choose the colors you will use to show the different elevations. Have the legend maker create the map legend. Be sure to include the scale and a compass rose.
3. Build the map. Using your hands, begin building the areas of highest elevation. Continue building from the highest to lowest elevations. Be sure to allow space for rivers. Form rivers with a pencil or plastic knife. (Hint: Check your elevations and scale.)
4. Locate and label features. Push the toothpicks gently into the land forms. Allow the map to dry.
5. Paint the map. Use the colors on your legend. (Hint: Allow one section to dry before painting the area next to it.
6. Add the legend. Title your map.
7. Look over your work. Make sure that you have included a legend, scale, and compass rose. Check your spelling.

Lesson Plan 2: Albuquerque Geology
Alien Invasion - Rio Grande Bosque
By Jachalyn Esra

New Mexico Standards
Social Studies: I-A1, II-B3, II-C2
Science: II-II-1
Language Arts: I-B2, I-C-5, I-D5, II-A1-4, II-B, II-C1

Objective: Students will identify some of the better known invasive species, describe ways invasive species have affected the environment and recognize why it may be unwise to introduce exotic species.

Grade: 4th

Group Size: 25 (partners, 5-6 small groups)

Duration: 2 to 3 one-hour sessions

Setting: Classroom, outdoors

Activity 1: Introducing Native and Non-Native Species

Materials:
- Cookie sheet
- Flashlight
- 1-gram weights

Set-up:
Stack an equal number of weights in each corner of the cookie sheet. Make sure the stacks are as close to the corners as possible.

Procedure:
1. Introduce the lesson by telling the students that each corner of the cookie sheet represents one of the four kinds of organisms living in the bosque: plants, decomposers, carnivores, and herbivores. Explain that a balance exists within this habitat. Carnivores eat some of the herbivores who eat plants. When the animals die, they provide food for the decomposers who make nutrients available to the plants. Stand the flashlight in the middle of a table. Balance the cookie sheet on top of the flashlight.
2. Ask the class to imagine that a new animal from another habitat was introduced into the bosque. This animal is an herbivore and has no natural enemies. The number of animals increases while the number of plants decreases. (Remove weights one by one from the plant area while describing the new animal.) Continue until the cookie sheet falls.
3. Explain that the original four groups on the cookie sheet represented native species and the new animal represented a non-native species. Tell students that some non-native species are

called invasive and have caused problems in the riparian environment like the Rio Grande bosque.

[This activity was adapted from "Lessons from the Bay Native vs. Non-native Species: Who Will Win?" from the Virginia Department of Education.]

Activity 2: Researching Native and Non-Native Species

Materials:

- Reference materials (encyclopedias, field guides and other non-fiction books)
- Computers
- Index cards
- Poster board

Set-up:

1. Make a poster with the following headings: amphibians, fish, birds, mammals.
2. Select and write the names of native and non-native animals on index cards. Include amphibians, fish, birds, and mammals.

   Suggested native animals: northern leopard frog, western chorus frog, Rio Grande silvery minnow, Rio Grande bluntnose shiner, red shiner, shovelnose sturgeon, killdeer, great blue heron, great-horned owl, red-wing blackbird, willow flycatcher, summer tanager, little brown bat, meadow jumping mouse, white-footed mouse, muskrat, beaver, Botta pocket gopher.

   Suggested non-native animals: bullfrog, mosquito fish, carp, house sparrow, European starlings, brown-headed cowbirds, house mouse, Norway rat, feral cats and dogs

Procedure:

1. Assign the research project. Explain that students will research in pairs. Each group will collect information about one animal from the bosque. Their reports must include
   - a physical description of the animal's appearance and sketch or photo
   - details about its native habitat, behavior and eating habits
   - whether it is native or non-native species.
2. Divide the class into pairs. Have each pair draw an index card from the pile, write their names on the card, and glue the card to the poster under the appropriate heading.
3. Allow students adequate time to research their animals.
4. Have pairs share their findings by summarizing their reports and explaining their posters.

Activity 3: The Survival Game

Materials:

- One package of dried, vegetable rotini or rigatoni (made from wheat, spinach, carrots)
- Two other shapes of dried pasta (macaroni, shells, bowties, penne, wagon wheels)
- Three kinds of dried beans (red or kidney beans, pinto beans, lima or great-white beans)
- Six zippered baggies
- Six containers or bowls
- Rubber bands
- Game cards

Set-up:

1. Copy and laminate game cards. Cut apart and separate the cards by species. Make sure description cards are on top before putting a rubber band around sets.
2. Create a poster identifying the food items.
3. Assemble food items. Fill each baggie with 20 pieces of pasta or beans. Label as follows: fruit (red rotini), seeds (pinto beans), insects (macaroni), grasshoppers and beetles (green rotini), flying insects (red beans), garbage (yellow rotini).
4. Find a large, open area outdoors. Make sure the area matches one color of food. Scatter the items.

Procedure:

1. Divide the class into 6 groups, one for each bird. Give each team a set of game cards. Take the class outdoors. Show the class the poster and explain that various tasty foods are hidden in the area. Allow each group time to read the top card, which describes their bird and what food to look for.
2. Explain that the game is played like a relay race. One at a time, each team member will try to collect as much food as possible. **Students may only use one hand.** Students place collected food in their containers and sit down as their teammates continue the game. The round ends when the first group is all seated.
3. Have students check their containers. Which group has collected the most food? Which group has collected the least? Why?
4. Before beginning the second round, have the group leader hand out the cards from their stacks. Some students may lose their turns this round or not be able to find any food. The game proceeds as before. The game ends when all or most of the food is found.
5. Ask students to determine which birds would have flourished. Which species might die out? Have them identify the invasive birds and tell why they might be considered harmful.

Assessment: Students will be evaluated on their class participation, small group work, and group presentations.

Class Participation Rubric*

5 points	4 points	3 points	2 points	1 point
Well prepared for class, attempts to answer questions and adds relevant outside information. Makes excellent use of time	Prepared for class, attempts to answer questions. Makes good use of time	Occasionally not prepared for class, listens but does not volunteer. At times interrupts or talks.	Often not prepared for class, does not listen. Gives up easily, not engaged.	Rarely prepared, minimal or no participation. Disrupts, not on task.

Small Group Rubric

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[adapted from www.bconney.net/]

Class Presentation Rubric

3 points	2 points	1 point
Substantial information including visuals. Answers or comments on most questions. Oral presentation well-paced and clear.	Substantial information including visuals. Answers or comments on most questions. Oral presentation too fast or slow and not clear enough.	Limited factual information or visuals. Incomplete questions or comments on questions. Oral presentation poorly paced and unclear.

Extensions:

1. Create "wanted" posters for non-native species. Posters should include the name, picture, native habitat, region where problems occur, and its crime.
2. Play "The Deadly Plant Invaders Game."
3. Research local, state, and federal laws regulating non-native plants.
4. Search newspapers for articles related to problems caused by invasive species.
5. Contact the local extension office or conservation district.
6. Write an essay about how non-native species have been of personal harm or benefit.
7. Conduct a plant survey of the schoolyard or student's backyard. Students identify, sketch or photograph, and categorize 10 plants.

Resources

Bacula, Karen and Dave Kronk. "The Deadly Plan Invaders Game"
http://www.nps.gov/piro/lp05.htm
National Park Service; Template for Wildlife Mgmt Lesson Plans

The Bosque Education Guide

http://museums.state.nm.us/nmmnh/BEG/beghome.htm
Background information, activities, maps

Earick, Doug. *The History and Development of the Rio Grande River*
http://www.unm.edu/~abqteach/EnvirCUs/99-03-04.htm

The Invasive Species Initiative
www.tncweeds.usdavis.edu/index.html
Nature Conservancy

Virginia Department of Education. *Lesson from the Bay*.
www.pen.K12.va.us/VDOE/watershed/

Teacher resource
www.invasivespecies.gov/

Field Trip
Rio Grande Nature Center State Park
2901 Candelaria Road NW
Albuquerque, NM 87107
505-344-7240

Red-winged Blackbird **Description:** Blackbirds catch insects to feed their young. They eat seeds in winter.	**Willow Flycatcher** **Description:** Flycatchers eat flying insects. Often they are infected by parasites from cowbirds and die.	**Summer Tanager** **Description:** Tanagers feed insects to their young. They will eat bees and wasps as well as fruit.
European Starling **Description:** These are highly competitive birds. They are aggressive and evict other birds from their nests. Starlings primarily eat insects but will also eat seeds and garbage.	**House Sparrow** **Description:** These birds take over other birds' nests and kill the eggs and nestlings. Sparrows eat seeds; especially weed seeds, and insects.	**Brown-headed Cowbird** **Description:** These birds lay their eggs in other birds' nests. The chicks are aggressive and out-compete other birds for food. Cowbirds eat seeds and occasionally grasshoppers or beetles.

European Starling Today you will only eat garbage.	**House Sparrow** Today you will eat seeds.	**Brown-headed Cowbird** Today you will eat insects.
Red-winged Blackbird Today you will eat seeds.	**Willow Flycatcher** You are infected with a parasite from a cowbird. You lose a turn.	**Summer Tanager** Today you will eat fruit.

European Starling Your Choice	**House Sparrow** Your Choice	**Brown-headed Cowbird** Your Choice
Red-winged Blackbird Your Choice	**Willow Flycatcher** Your Choice	**Summer Tanager** Your Choice

European Starling Your Choice	**House Sparrow** Your Choice	**Brown-headed Cowbird** Your Choice
Red-winged Blackbird Your Choice	**Willow Flycatcher** Your Choice	**Summer Tanager** Your Choice

European Starling Your Choice	**House Sparrow** Your Choice	**Brown-headed Cowbird** Your Choice
Red-winged Blackbird Your Choice	**Willow Flycatcher** Your Choice	**Summer Tanager** Your Choice

European Starling Today you will eat seeds.	**House Sparrow** Today you will eat insects.	**Brown-headed Cowbird** Today you will eat seeds.
Red-winged Blackbird A sparrow took over your nest. You lose a turn.	**Willow Flycatcher** A cowbird laid its eggs in your nest. You lose a turn.	**Summer Tanager** A cowbird laid its eggs in your nest. You lose a turn.

European Starling Your Choice	**House Sparrow** Your Choice	**Brown-headed Cowbird** Your Choice
Red-winged Blackbird You are infected with a parasite from a cowbird. You lose a turn.	**Willow Flycatcher** A sparrow took over your nest. You lose a turn.	**Summer Tanager** You are infected with a parasite from a cowbird. You lose a turn.

Lesson Plan 3: Albuquerque Geology
The Sandia Mountains
By Jachalyn Esra

New Mexico Standards:
Social Studies: II-A1-3
Mathematics: II-C1, III-D1, IV-A2, IV-C1
Language Arts: I-B2, I-D-5, II-A1-2, II-B9

Objective: Students will analyze topographic maps and interpret information shown. Students will use topographic maps to create a three-dimensional model of the Sandia Mountains.

Grade: 4th

Group Size: 25 (small groups)

Duration: 3 class sessions

Setting: Classroom

Activity 1: What Do Maps Show?

Materials:
- Atlases
- Road maps
- Shaded relief maps
- Political maps
- Population or product maps

Procedure:
1. Brainstorm a list of different kinds of maps. Record them on the board or chart paper. (Examples: road maps, population maps, weather maps, product maps, shaded relief maps, political maps)
2. Discuss the reasons for having so many different kinds of maps.
3. Divide the class into small groups. Give each group a different kind of map. Ask students to write down two things that they can learn from their maps.
4. Have groups share what they learned from their maps. Key points should include direction, relative location, scale, distance, and elevation.

Activity 2: 3D Landscapes in 2D

Materials:
- Topographic maps and shaded relief maps of the Albuquerque-Sandia Mountain area
- Clear plastic boxes with lids (food containers or shoeboxes)
- Tracing paper
- Metric ruler
- Masking tape
- Pencils
- Non-hardening modeling clay

- Water
- Overhead transparencies, overhead marking pens
- Large plastic cups
- Direction sheet

Set-up:
Collect materials. Download maps if needed. Copy direction sheet.

Procedure:
1. Compare a shaded relief map and a topographic map of the region. Explain to the class that a shaded relief map uses light and shadow to show physical features of a place and looks more like a picture. A topographic map uses contour lines to show elevations. If you run your fingers along the contour lines, you can feel the shape of the land but it is not always easy to visualize the land.
2. Explain the topographic mapping activity. Remind students that this is not the actual procedure cartographers use but that it will help them understand topographic maps.
3. Divide the class into small groups. Hand out the direction sheets.
4. Allow students time to complete the activity.
5. Have students share their maps.
6. Ask students the following questions at the end of the sharing session:
   - What is the elevation of the highest hill?
   - How do you know where the lowest layers are?
   - Are rings smaller at the top or bottom of the mountains?
   - How can you tell if the slopes are steep or gentle?

Activity 3: Building the Sandia Mountains from a Topographic Map

Materials:
- Non-hardening clay
- Dowel rod rollers
- Pencils
- Cardboard (one for each group)
- Simple topographic maps of the Sandia Mountains
- Task sheet

Set-up:
1. Collect materials.
2. Create a simplified version of the Sandia Mountain topographic map.
3. Make copies of Sandia Mountain topographic map.
4. Make copies of the task sheet.

Procedure:
1. Tell the class that they will be building a model of the Sandia Mountains using a topographic map. Hand out the task sheets and go over the directions.
2. Divide the class into small groups. Allow students time to collect materials and build their models.
3. Display models and allow students time to view and ask questions.

[Activities 2 & 3 adapted from "The Great Flood" by Carole J. Reesink in Water, Stones, & Fossil Bones]

Assessment: Students will be evaluated on class participation, small group work, and group models.

Class Participation Rubric

5 points	4 points	3 points	2 points	1 point
Well prepared for class, attempts to answer questions and adds relevant outside information. Makes excellent use of time	Prepared for class, attempts to answer questions. Makes good use of time.	Occasionally not prepared for class, listens but does not volunteer. At times interrupts or talks.	Often not prepared for class, does not listen. Gives up easily, not engaged.	Rarely prepared, minimal or no participation. Disrupts, not on task.

Small Group Rubric

4 points	3 points	2 points	1 point
Outstanding effort and contribution to project. Demonstrates full understanding and use of key ideas and concepts. Recorded work clear and well organized.	Good effort and contribution to project. Demonstrates essential understanding of the key ideas and concepts. Recorded work mostly accurate and appropriate.	Fair effort and contribution to project. Demonstrates partial but limited understanding of key ideas and concepts. Recorded work may be incomplete, misdirected or unclear.	Minimal effort and contribution to project. Demonstrates little or no understanding of the key ideas and concepts. Recorded work is difficult to understand.

[Rubrics adapted from www.bconney.net/]

Mountain Model Rubric

	4 points	**3 points**	**2 points**	**1 point**
Group Work	Each member was responsible for his/her duties. All performed exceptionally well.	Each member was responsible for his/her duties. All or most members performed well.	Some members were responsible for their duties. Some performed satisfactorily; others did not.	Few or no members were responsible for their duties. Performance was minimal.
Accuracy	Finished model precisely represents the mountain. Elevations are accurate.	Finished model represents mountain. Elevations are accurate.	Finished model somewhat represents the mountain. Some layers are misshapen or out of place.	Layers are misshapen, out of place or missing.
Quality	Finished model is neat and sturdy.	Model is neat and sturdy.	Finished model resembles the shape of the mountain. Work lacks neatness.	Model is incomplete and lacks neatness.
Questions	All answers are complete and clear. Spelling is correct.	Answers are appropriate.	Answers are incomplete, inappropriate or unclear.	Answers are missing or difficult to understand.

Extensions:
1. Create a bulletin board display of maps collected from magazines and newspapers.
2. Watch the evening news over a three-four night period. Make a list of the different kind of maps used and what they show.
3. Research and write about the history of maps.
4. Draw a map of the school. Develop your own scale.
5. Build other geologic formations from topographic maps.
6. Use a commercial topographic map to create a set of questions.

Resources

Books

Lind, Karen K. Water, Stones, & Fossil Bones. NSTA. 1991.

Maps/Diagrams

Albuquerque, City of view from space
http://terraserver-usa.com

Albuquerque's Hydrologic Cycle
http://www.cabq.gov/aes/
Cross-section view of Rio Grande valley

Albuquerque Natural Features
http://www.cabq.gov/aes
Diagram of land formations

Albuquerque, Rio Grande view from space
http://earth.jsc.nasa.gov/sseop/efs/geon.htm
NASA

Menaul Section of the Albuquerque Aquifer
http://www.cabq.gov/watrconservation/insert.html

New Mexico landform atlas
http://fermi.jhuapl.edu/states/
Shaded relief map, satellite image

New Mexico map
http://www.50states.com/maps/
Printable state maps from 50 states

New Mexico map
http:www.nationalgeogrpahic.com/expeditions/atlas/index.html
Printable state maps from National Geographic

New Mexico relief maps (available from Textbook Depository)

New Mexico topographic maps
http:///sar.lanl.gov/topo_maps/
Search and rescue maps provided as a public service by Los Alamos National Laboratory

New Mexico topographical map
http://www.ngdc.noaa.gov/mgg/topo/state.html
Color maps from National Geophysical Data Center

Rio Grande Rift
http://www.cabq.gov/aes/
Cross-section diagram of Rio Grande Valley

Web Sites

Albuquerque's Environmental Story
http://www.cabq.gov/aes/

Easy to See in 3D
http://wwwedu.ssc.nasa.gov/fad/detail.asp?offset=10&LessonID=48)

Houghton Mifflin GeologyLink
http"///college.homco.com/geology/resources/feologylink/fieldtips/natrips/us_west.html
Virtual field trip links

Sandia Mountains
http://www.cybergata.com/sandia.htm
Photos and brief descriptions

What Do Maps Show?
http://interactive2.usgs.gov/learningweb/teachers/mapsshow/
SSGS lesson plans, teacher guide, activities

Constructing a Topographic Map

Materials:

plastic box with lid
metric ruler
pencil
masking tape
scissors
tracing paper
water
modeling clay
large plastic cup

Directions:

1. Place a piece of masking tape vertically on the side of the box. Starting at the bottom, make a pencil mark every centimeter.
2. Create a simple mountain shape out of the clay. Place it in the box. Make sure that your mountain is not taller than the box.
3. Add water to the box until it reaches the first mark on your tape.
4. Use a pencil to trace the water line completely around your mountain.
5. Add more water until it reaches the second mark. Trace this water line again.
6. Continue filling the box and marking the water line until the mountain is completely underwater.
7. Carefully pour the water out, keeping the mountain in the box. Put the lid on the box and tape a piece of clear plastic on top of the lid.
8. Starting at the center, trace each contour line. (Hint: Close one eye. Look directly above the pen as you draw.)
9. Remove the plastic sheet. Place a piece of tracing paper over the top and retrace the lines.
10. Label the paper with a scale of 1 cm = 100 m. Mark the correct elevation on each contour line. Indicate the highest elevation with an "X".

The Sandia Mountains

Building a 3D model from a Topographic Map

Materials:

cardboard
metric ruler
pencil
modeling clay
scissors
topographic map

Directions:

1. Collect all materials.
2. Roll out the first layer of dough to a thickness of 1 cm.
3. Cut out the paper map and place it on top of the clay. Use your pencil to trace the contour line and "cut" out this shape. This is the lowest elevation. Place it on the cardboard base.
4. Reuse the leftover clay and roll out another 1 cm thick piece. Using the same paper map, cut around the next contour line. Place it on top of the clay, trace the contour line, and cut out the shape. Put this layer on top of the first.
5. Repeat step 4 until all level have been cut out and stacked. (Note: Your finished model will resemble a wedding cake.)
6. Compare your finished model with the original map. How accurate is your model? Answer the following questions on the back of this sheet.

    - Is your mountain peak in the same location as the maps?
    - Is the peak's elevation the same as on the original map?
    - How could you make a more accurate model?

The First People of the Rio Grande Valley

The Rio Grande Valley was the scene of human activity for thousands of years before Europeans ever laid eyes on it.

Paleo-Indian People

Paleo-Indian people, who arrived from 12,000 to 7,500 years ago, were the earliest people to live here.

It was then the end of the Pleistocene period. The climate then was cooler and wetter, and there were glaciers on top of the Sandia Mountains and small shallow lakes called *playas* on the West Mesa.

The people hunted a wide variety of now extinct large game animals (megafauna) that roamed the river valley, including the mastodon, mammoth, sloth, giant armadillo, and bison antiquis. Their lives, tools and technology centered around hunting large game and gathering plants and seeds.

They moved their campsites often and over great distances. Small groups, probably extended family members, moved up and down the Rio Grande Valley in search of a variety of flora, fauna, and material items. The oldest artifacts found on the West Mesa are Folsom, and these date to about 11,000 years ago.

Archaic People

Archaic people, who were here from 7,500 years ago to AD 500, lived in much the same way. But with the extinction of large animals, they had to hunt smaller game. They also learned to use local plant species more extensively.

Over time, these small groups tended to stay within certain areas, relying on known local resources. As certain areas became more like home, they modified their tools to more specific resources, and tools became much less portable. By about 4,000 years ago, camp sites included larger and larger grinding slabs, and cooking pits and middens, or trash piles suggest people returned to the same place every year after making a seasonal journey to hunt game and gather plants.

This repeat visitation suggests that these early people were familiar enough with their environment to begin the type of plant selection that we call horticulture. Within this lifeway of semi-sedentary hunting, gathering, and horticulture, about 2,000 to 3,000 years ago, maize (the first corn) and maize agriculture appear in various locations within New Mexico, having arrived from central Mexico.

Agriculture was introduced to the Rio Grande valley shortly after this. Maize became a staple that was reasonably reliable, fairly abundant, and permitted a crop surplus that further reduced the need for mobility. This introduction marks the earliest beginnings of the settled lifeway associated with Pueblo culture. On the West Mesa, maize cobs and squash date to about 1,500 years ago.

Pueblo People

Between 500 BC and AD 500, the change from semi-sedentary hunter-gatherer to farmer came slowly, as the number of settled people increased. They lived in pithouses

(circular pits covered with sticks and hides). These pithouse villages became larger, and more sedentary materials were used – especially pottery. The gradual shift from subterranean villages to semi-subterranean pithouses, and finally surface structures occurred from about AD 500 to 900 in the Four Corners area and in the Mogollon Mountains of southern New Mexico.

Not until AD 900 did the traditional pueblo way of life become well established in the Albuquerque area.. This way of life was characterized by year-round living in above-ground villages and an economy based on growing corn, beans, and squash. Small pueblos, mostly made from stone, were built in the Sandia foothills and Tijeras Canyon areas during AD 1100-1200.

After A.D. 1200, the population of the Rio Grande Valley increased as the Four Corners and Mogollon Mountains were abandoned, likely due to drought. By about AD 1300 the Albuquerque area experienced a population explosion. At least 40 villages, many of adobe and standing several stories high, were built on both sides of the river between Bernalillo and Belen. Many had hundreds of rooms; the largest had over 1,000 rooms and probably several thousand inhabitants. Over time, Pueblo people lived in fewer and larger villages, for defense and because improved irrigation methods increased their food supplies to support bigger villages.

European Arrival

When the Spaniards led by Coronado arrived in 1540, they called these villages "pueblos," their word for "town." Captain Hernándo de Alvarado described 12 pueblos in present-day Albuquerque: "The houses are made of mud, two stories high. The people seem good, more given to farming than to war. They have provisions of maize, beans, melons and fowl in great abundance. They dress in cotton, (buffalo) skins, and coats made with the feathers..."

Another soldier in 1580 described the people of the Albuquerque area: "They make tortillas and corn flour gruel (*atole*), have buffalo meat and turkeys – they have large numbers of the latter." Every family had a pen with at least 100 turkeys in it. The people wore cotton blankets and tended large fields of cotton. They kept many small, shaggy dogs, which they kept in underground pens.

The pueblos nearest to Albuquerque were those of Puaray. Coronado asked the people of one village, called Alcanfor, to give up their quarters to house his men for the winter, which they did grudgingly. The newcomers also insisted the native people give them food and blankets. When two pueblos, Arenal and Moho, rebelled by stealing and killing the Spaniards' horses, Coronado attacked the pueblos and burned them. Fearful residents abandoned other Tiguex pueblos.

In 1680 all of New Mexico's pueblos united in a successful revolt, which drove the Spaniards from New Mexico for 12 years. When they returned in 1692 there were few pueblos in the Middle Rio Grande Valley. By 1706, at the founding of Albuquerque, there were none, although Sandia and Isleta people would return to resettle their villages.

Today New Mexico has 19 pueblos, each governed autonomously.

They don't all speak the same language. The Zuni Pueblo people who live south of Gallup speak Zuni. Keresan is the language of five pueblos north of Bernalillo (Santo Domingo, Cochiti, Santa Ana, San Felipe, and Zia) and two western pueblos (Laguna and

Acoma). Taos, Picuris, Sandia, and Isleta people speak Tiwa. Santa Clara, San Ildefonso, San Juan, Pojoaque, Tesuque, and Nambe speak Tewa. Towa is spoken at Jemez Pueblo.

Pueblo Life

Agriculture

Because corn was the dietary staple, good agricultural land was necessary for the establishment of a village. They also chose locations where the growing season was at least 120 days and where water was sufficient for both crops and domestic use. Sometimes the Pueblo people diverted stream water using ditches and canals. Other times they spread gravel mulch on garden plots to keep moisture in the soil and built check dams on slopes.

Using wooden digging sticks and hoes of stone and animal bone, they planted crops in several different settings so that if one area failed they might still have crops in another area. Corn depletes nitrogen in the soil, but the Pueblo people also planted beans, which add nitrogen. They also grew squash and some cotton.

Turkeys were kept for both feathers and meat. The only other domestic animal was the dog, used not for meat but as a guard animal.

Archaeologists know that there was a great deal of trade between villages. Pueblo people traded food and woven cloth to Eastern Apaches for buffalo robes. Other trade commodities were salt, hides, shells and cotton (for clothing).

Wild Foods

They gathered wild plants, including piñon nuts, Indian rice grass, amaranth, chokecherry, wild plum, cacti and other plants. Hunting provided not only animal meat but also fat, leather and bone for tools.

A variety of birds were hunted for their feathers, such as hawks, owls, eagles, bluebirds, quails, doves and waterfowl.

Tools

Manufacture of tools for food processing required many raw materials. Wood was needed for digging sticks and bows. Arrowheads, knives, and scrapers were made from stone shaped by flaking. Sandstone, basalt or limestone was used to make manos and metates for grinding corn. Baskets made of reed and yucca fiber were used to winnow grains and carry things. A common tool used by the Pueblo people was the awl, made from the bone of deer or antelope and used in making baskets.

Pottery was important to the pueblo people. They fashioned bowls and jars for cooking, storage and serving food and water. Pottery making required a source of fine clay which helped prevent shrinking and cracking during firing. Potters used organic pigments and mineral pigments to decorate their wares. From about AD 130 to the 1700s the Pueblo people of the Rio Grande Valley used a glaze paint made by grinding up lead to decorate their bowls.

Images

The rich spiritual life of the Puebloan ancestors is reflected in wall paintings found in underground ceremonial rooms called kivas. Thousands of images carved into the basalt boulders of the nearby West Mesa have a strong connection to the mural paintings. Many Pueblo people believe that the petroglyphs are alive and have direct ties to their ancestors.

Architecture

Each Pueblo was different but all included contiguous rectangular rooms, ceremonial rooms (square or round), a plaza and a trash area (midden*).* Rooms were constructed of either rocks set into adobe mortar or of puddled mud, which was adobe built up in thin layers to form walls. Adobe bricks were introduced by the Spanish. Timber was cut for vigas and latillas and used to support flat adobe or earthen roofs. Each village needed wood not only for houses but for firewood for cooking and heating.

The ancestors of today's Pueblo people, like all other humans, required food, water, shelter, the comfort of others and a sense of security in dealing with the natural environment. They had no wheels and no written record. They had to master many different skills in order to survive, and they had to work cooperatively, according to a schedule. They learned from the experiences of those in their community and each village became an independent political unit. Since they did not "own" the land each village worked hard to use the resources according to their needs.

References:

Roberts, Calvin A. and Susan A. Roberts. A History of New Mexico.

Rosner, Hy and Joan. Albuquerque's Environmental Story: Toward a Sustainable Community.

Sánchez, Joseph P. The Rio Abajo Frontier, 1540-1692: A History of Early Colonial New Mexico.

Simmons, Marc. Albuquerque: A Narrative History

Sturtevant, William C., ed. Handbook of North American Indians: Southwest, Vol. 9.

Lesson Plan: First People
Digging into Our Past
By Jachalyn Esra

New Mexico Standards:
Social Studies: I-D1
Science: I-I-4, I-II-1, I-II-2, I-III-3
Mathematics: III-B3, III-D3, IV-A1, IV-A2, IV-B3, V-A1, V-B3
Language Arts: I-B2, I-C-5, I-D5, II-A1-4, II-B, II-C1

Objective: Students will simulate the role of archaeologists. Working in small groups, students will excavate "artifacts," describe and interpret their functions, construct a hypothetical scenario, and discuss findings with the class.

Grade: 4th

Group Size: 25 (The number of students determines the number of "dig" sites. Divide the class into groups of 4 to 5 students.)

Duration: 3 one-hour sessions

Setting: Classroom, outdoors

Activity 1 – What is an Archaeologist?

Materials:
- Chocolate chip cookies (one for every two students)
- Paper clips
- Journals
- Reference materials (textbooks, trade books, magazines, maps, websites, newspaper articles)

Set-up:
1. Collect resource materials for the class library and the archaeological site.
2. Request permission to dig outside.
3. Prior to the dig, set up the outdoor area. Divide it into 5 or more sections and mark the boundaries with string. Assign a bag of "artifacts" to each section and bury the items.

Procedure:
1. Ask students to tell what they think an archaeologist is. Record student responses on chart paper.
2. Provide students with background information on archaeology by reading and discussing a selection from one of the books listed in the resource page. Compare archaeologists to modern day detectives.
3. Have students define and give examples of "artifacts." Discuss what materials might be preserved and how they were used:
- How do archeologists learn from objects that are incomplete or altered by weather or use?
- How do artifacts provide clues about people and how they lived (food, shelter, etc.)?
- What information cannot be learned from artifacts? How do archaeologists know where to look?
- What tools and methods are used to excavate artifacts?

4. Distribute one chocolate chip cookie and one paper clip per team of two students. Encourage students to work as archaeologists to "excavate" one chocolate chip from the cookie. Remind them that the goal is to extract the chip intact, just as a real archaeologist would try to unearth an artifact in one piece. Students complete the excavation and write their responses to the following questions in their journals:

- Was it easier or more difficult than you thought it would be to excavate a chip in one piece?
- Was it easier to excavate a chip from the center or the side of the cookie?
- How is this activity like the ones archaeologists do at real excavation sites?

Share student responses.

[Chocolate chip activity adapted from The New York Times Learning Network lesson plan, "Digging Into the Past" by Jackie Glasthal.]

Activity 2 – The Archaeological Dig

Materials:

- Pencils, paper, worksheet
- Tools: spoons, toothbrushes or small paintbrushes, tweezers, small trowel
- Ruler, grid paper
- Sifters
- Clipboards
- Buckets or tubs
- Newspaper
- Shoeboxes
- Bags containing items that might represent the following:

  Hunting-Gathering: bones, fur, leather strips, animal drawing on hide or rock, bone jewelry, arrowheads, burnt wood

  Farming: corn kernels or cobs, stone tools, bean and squash seeds, baskets, pottery shards

  Fishing: fish bones, nets, fish hooks, line, mussel shells

  Trading: coins, tally stones, shells, pottery shards

  Herding: animal skins, clubs, fence materials, dried meet, herding tools

Procedure:

1. Review the procedures for excavating and recording findings. Remind students that archaeologists need to follow the scientific method as other scientists do.

- Remove dirt carefully, about one inch at a time. Place soil in box or tub.
- Sift removed soil on newspaper to make sure all artifacts are found.
- When an artifact is found, use small brushes to push away soil. Try not to break or destroy the artifact. When it is mostly uncovered, record its location on the grid paper.
- Remove the artifact, sketch and hypothesize about its use. Record findings on the worksheet.

2. Divide the class into small groups. Have groups assign members roles: recorder, teacher contact, materials manager, sketch artist, excavator, etc.
3. Distribute tools and materials. Assign each group a section of the dig site.
4. Have students determine the perimeter and area of their site and then make a scale drawing of the site using the grid paper.
5. Have students excavate their sites and record their findings. Allow 20-30 minutes.

6. Circulate among the groups and give direction as needed.
7. At the end of the session, have students replace the dirt, collect tools, and store artifacts in their shoeboxes.

Activity 3: Class Presentation

Materials:

- Poster board
- Markers

Procedure:

1. Remind students that real archaeologists do not have all the answers. They often must make hypotheses based on what they know for sure. Archeologists use diagrams, drawings and other visual aids in their reports. Real scientists share the work.
2. Allow time for groups to review their artifacts and inferences about the site. Write the following guiding questions on the board:
   - What did we find?
   - Where were the artifacts found?
   - How do we think each item was used?
   - Does it appear to be hand- or machine-made?
   - Why was it probably found in that spot?
3. Have students create graphic organizers or posters for their sites. Each poster will depict an artifact from the dig site and tell about the people who might have once lived there.
   - Description and illustration of one artifact
   - Description and illustration of clues to the people who may have lived there
   - List of questions raised by the artifact
4. Have a representative from each group share their findings.

Assessment: Students will be evaluated on the written journal entries, class participation, small group work, and group presentations.

Journal Entry Rubric

4 points	3 points	2 points	1 point
Outstanding language skills. Demonstrates full understanding and use of key ideas and concepts. Recorded work clear and well organized. Goes beyond all requirements	Good language skills. Demonstrates essential understanding of the key ideas and concepts. Recorded work mostly accurate and appropriate. Satisfies all requirements.	Fair language skills. Demonstrates partial but limited understanding of key ideas and concepts. Recorded work may be incomplete, misdirected or unclear. Satisfies some requirements.	Limited or weak language skills. Demonstrates little or no understanding of the key ideas and concepts. Recorded work is difficult to understand. Satisfies few requirements.

Class Participation Rubric

5 points	4 points	3 points	2 points	1 point
Well prepared for class, attempts to answer questions and adds relevant outside information. Makes excellent use of time.	Prepared for class, attempts to answer questions. Makes good use of time.	Occasionally not prepared for class, listens but does not volunteer. At times interrupts or talks.	Often not prepared for class, does not listen. Gives up easily, not engaged.	Rarely prepared, minimal or no participation. Disrupts, not on task.

Small Group Rubric

4 points	3 points	2 points	1 point
Outstanding effort and contribution to project. Demonstrates full understanding and use of key ideas and concepts. Recorded work clear and well organized.	Good effort and contribution to project. Demonstrates essential understanding of the key ideas and concepts. Recorded work mostly accurate and appropriate.	Fair effort and contribution to project. Demonstrates partial but limited understanding of key ideas and concepts. Recorded work may be incomplete, misdirected or unclear.	Minimal effort and contribution to project. Demonstrates little or no understanding of the key ideas and concepts. Recorded work is difficult to understand.

[Rubrics adapted from www.bconney.net/]

Class Presentation Rubric

3 points	2 points	1 point
Substantial information including visuals. Answers or comments on most questions. Oral presentation well-paced and clear.	Substantial information including visuals. Answers or comments on most questions. Oral presentation too fast or slow and not clear enough.	Limited factual information or visuals. Incomplete questions or comments on questions. Oral presentation poorly paced and unclear.

Extensions:

1. Research a famous archaeologist or archaeological find.
2. Visit a local museum or virtual museum online to observe ancient artifacts.
3. Research different archeological methods.
4. Create a scavenger hunt on the Internet.
5. Create a personal site box. Include "artifacts" that relate to grandparents, parents, and self.
6. Select a family photo that could serve as an "artifact" about your family. Write a description of the picture and its importance.

7. Create a timeline for an important historical dig. Write a brief description of each event.
8. Create a game show based on information learned.
9. Create a personal time capsule that captures what life is like in the current year.
10. Collect and display newspaper advertisements that depict present-day artifacts. Look for items that are useful to most people, that relate to work and/or leisure time, that are unusual, and that are likely to be long lasting. Write a news article for a future newspaper that describes the importance of these finds.
11. Email an archaeologist with a pertinent question.
12. Classify all artifacts from the dig and make a graph for the results.
13. Make a scale drawing of an artifact.
14. Explore an interactive online exhibit such as the Reed Farmstead.

Resources

Books

Arnold, Caroline. The Ancient Cliff Dwellers of Mesa Verde. Clarion. 2000 (pb).

Avi-Yonah, Michael. Dig This! How Archaeologists Uncover Our Past. Runestone Press, Minneapolis, 1993.

Cole, Joanna. The Magic School Bus Shows & Tells: A Book about Archaeology. Scholastic. 1997 (pb).

Cooke, Jean et al. Archaeology. Franklin Watts. 1982.

Cork, Barbara 7 Struan Reid. The Usborne Young Scientist Archaeology. E. D. C. Publishing. 2005.

Currier, Richard. Search for the Past (Digging Up the Past). Minneapolis: Lerner Publication Co. 1984.

Devereaux, Paul. Archaeology: The Study of Our Past. Gareth Stevens Publishers. 2002.

Fradin, Dennis B. Archaeology. Chicago: Children's Press. 1983.

Goodman, Susan E. Ultimate Field Trip 2: Digging into Southwest Archaeology. Aladdin Paperbacks. 2000.

Hicks, Peter. The Hidden Past (Remarkable World). Raintree Steck-Vaughn Publishers. 1997.

Jackson, Donna. The Bone Detectives. Megan Tingley. 1996.

James, Carolyn. Digging up the Past. Franklin Watts, 1990.

Lamb, Susan. Petroglyph National Monument. (available at the Petroglyph National Monument Bookstore.)

Lewin, Roger. In the Age of Mankind. New York#58: Smithsonian Institution. 1988.

Marston, Elsa. Mysteries in American Archaeology. New York: Walker & Co, 1986.

May, Julian. Going on a Dig. New York: Hawthorn Books. 1975.

McGowen, Tom. Adventures in Archaeology. Henry Holt, 1997.

McIntosh, Jane. Eyewitness: Archaeology. DK Children, 2000.

Moscati, Sabatino. Archaeology. F. Watts, 1975.

New Mexico Indian Education Association. Indian Perspectives in New Mexico History. ISBN 1879937026 (available from the Textbook Depository.)

Nichols, Peter & Bella Nichols. Archaeology: The Study of the Past. Eakin Press. 1998.

O'Brien, Karen and Robin White, Petroglyph National Monument Teacher's Guide, Grades K-8. (available at the Petroglyph National Monument Bookstore.)

Orna-Ornstein, John. Archaeology: Discovering the Past. Oxford University Press. 2002.

Panchyk, Richard. Archaeology for Kids, Uncovering the Mysteries of Our Past. Chicago Review Press. 2001 (pb).

Pickering, Robert B. I Can Be an Archaeologist. Chicago: Children's Press. 1987 (pb).

Robinson, Tony. Archaeology (Kingfisher Knowledge). Kingfisher Publishing. 2004.

Starnes, Gigi. Grandmother's Tales: Storm of Darkness (Discovering Archaeology). Eakin Press. 1995.

Warren, Scott. Cities in the Sand: The Ancient Civilizations of the Southwest. Chronicle Books. 1992.

Wheatley, Abigail et al. The Usborne Introduction to Archaeology: Internet-Linked. Usborne Books. 2005.

Web Sites

Anasazi Heritage Center (BLM is restoring this site)

Archaeology Channel
www.archaeologychannel.org/
Teacher resource links

Archaeology Links
http://emuseum.mankato.msus.edu/archaeology/archaeology/links.html
Links to other websites

Archaeology Magazine (http://www.archaelology.org/) official publication of the Archaeological Institute of America

Archaeology's Dig
http://dig.archaeology.org/
Online magazine with quizzes, games, facts, Ask Dr. Dig access

Crow Canyon Archaeological Center
www.crowcanyon.org/kids.html
Virtual tours southwestern Colorado pueblos

Cultural Heritage Education Program
www.co.blm.gov/ahc/index.htm

Dig in Progress
www2.pa.net/wpsd/wpms/dig/

Indigenous People of New Mexico
www.cybergata.com/native.htm
Resource links

Is the Past in your Future?
http://www.sha.org/sha_kbro.htm
Careers in archaeology

Mesa Grande National Park
www.digonsite.com
Excavations

National Park Service
www.nps.gove/petr/
Link to Petroglyph National Monument Web site, includes lesson plans

National Park Service Archaeology & Ethnography Program
www.cr.nps.gov/aad/

The Past Foundation
www.pastfoundation.org/
Links projects and researchers to students

Petroglyph National Monument Junior Web Ranger
www.nps.gov/petr/jrranger/
Interactive site

Petroglyphs.US
www.petroglyphs.us/
"Avocational" archaeologist site, captioned photos

Field Trips/ Trunk Shows

Indian Pueblo Cultural Center
2401 12th Street NW

Museum admissions staff 505-843-7270
www.indianpueblo.org

1. Museum
2. Pueblo House children's Museum
   By appointment only, contact Museum Admission Desk
   Designed for grades K-5, hands-on

Education Department
Maxwell Museum of Anthropology
MSC01 1050
1 University of New Mexico
Albuquerque, NM 87131-0001
505-277-2924
Martina Gutierrez
mlittle@unm.edu

1. Permanent Exhibits
   "Ancestors Exhibit"
   "People of the Southwest Exhibit"
2. Guided Museum Tour
   "People of the Ancient Southwest"
3. Checkout Kit
   "Southwest Treasure Box"
   Includes teacher's guide and student booklet
4. Traveling Trunk Exhibits
   "Ancient Tools and Technologies"

Museum of Archaeology and Material Culture
22 Calvary Road
Cedar Crest, New Mexico 87008
505-281-4745
www.museumarch.org/

1. Native American and Archaeology Exhibits
2. Museum Field School

Note: Open May 1 – October 31

Petroglyph National Monument
National Park Service, U.S. Department of the Interior
Las Imagines Visitor Center
6001 Unser Blvd. NW
Albuquerque, NM 87120 505-899-0207
www.nps.gov/petr/

1. Education Outreach – Monument Visits
   Boca Negra Canyon – Ranger will prepare custom program.
2. Education Outreach – Ranger Visits the Classroom
   Travel Trunk – "Ancestral Puebloan Lifestyle Trunk"
3. Visual slide program – developed as per request

Worksheet - Archaeology Dig

Group _____

Site Number_____

Directions: Record your observations of the artifacts unearthed at your site.

Object	Sketch	Material(s) made of	Possible use

Estancias in the Cottonwoods

Founding of Albuquerque

I certify to the king, our lord, and to the most excellent señor viceroy: That I founded a villa on the banks and in the valley of the Rio del Norte in a good place as regards land, water, pasture, and firewood. I gave it as patron saint the glorious apostle of the Indies, San Francisco Xavier, and called and named it the villa of Alburquerque. -- Don Francisco Cuervo y Valdes, April 23, 1706

Don Francisco Cuervo y Valdes, acting governor of the Province of New Mexico, sat at his writing table in the adobe structure now known as the Palace of the Governors in the Villa de Santa Fe. His letter assured the king and viceroy that the location of the new villa was well chosen.

General Juan de Ulibarrí had previously scouted this area and found that the place met Spanish requirements that a town site have tillable land, water, pasture and firewood.

Pueblo Revolt

The new villa was in a place known as the Bosque de Doña Luisa. It was named for the wife of landowner Francisco Trujillo. Their home and about 20 others had been established in the area earlier but were destroyed in 1680 during the Pueblo Revolt. Religious intolerance, forced labor and levies on food and weavings led the Pueblo people to rebel against Spanish missionaries and colonists. Three of the four pueblos in the Albuquerque area – Alameda , Sandia, and Puaray – joined in the revolt. More than 120 area colonists were killed, and 1,500 persons were forced to flee to El Paso, along with the people of Isleta Pueblo.

For the next 12 years the Province of New Mexico remained under the control of the Pueblo Indians.

The Reconquest

In 1691 the Spanish Crown appointed Don Diego de Vargas Zapata y Luján as governor, with a commission to reconquer and resettle the province. Vargas made an initial expedition into New Mexico in 1692, obtaining promises of cooperation from the Pueblo Indians. But it was necessary for Vargas to fight a series of skirmishes and pitched battles when he returned with colonists in 1693.

After the reconquest, colonists began to establish new farms and ranches, and to resettle homesteads abandoned during the Pueblo Revolt. It wasn't easy. New Mexico was parched by a six-year drought. Apaches and Navajos raided often, and the province was isolated from government and military aid. Vargas died in 1704 in Bernalillo while attempting to punish Apaches who had been raiding farms in the Rio Grande Valley.

New Governor

The viceroy appointed Francisco Cuervo y Valdéz as acting governor of the province, and he arrived on March 10, 1705.

Cuervo hoped to convince the king that his appointment should be permanent. He was, in fact, an experienced bureaucrat. Arriving in New Spain (Mexico) in 1678, he had

spent 25 years in Spanish colonial service in posts ranging from captain of infantry in Sonora to governor of the provinces of Nuevo Leon and Coahuila. He was regarded as a skilled administrator and soldier with considerable knowledge of frontier affairs.

New Mexico then didn't look promising. Cuervo wrote to his superiors: "I have never seen so much want, misery, and backwardness in my life. I suspect this land was better off before the Spaniards came." Over the next few months he inspected the regular troops and militia. Finding their numbers to be inadequate, he made repeated requests for more soldiers and spread the 100 regular soldiers stationed in Santa Fe around the province.

And he decided the Middle Rio Grande area needed a town.

Villa de Alburquerque

Early in 1706 Cuervo decided to found an administrative center in the Middle Rio Grande Valley. He was drawn to an area known as El Bosque Grande de Doña Luisa (The Large Grove of Doña Luisa) near the present site of Old Town.

The Villa de Alburquerque was established along El Camino Real, the Royal Road linking Santa Fe with distant Chihuahua and Mexico City. It was located in the *bosque* among the cottonwoods on an easy ford of the Rio Grande, the river to the west, and had good access to the Cañon de Carnue (Tijeras Canyon), a pass giving access to the plains beyond the mountains to the east. The villa was an ideal crossroads for all travelers to all parts of the province.

Cuervo chose the name Alburquerque to honor the Duke of Alburquerque, Francisco Fernández de la Cueva, who was then Spain's viceroy in Mexico – and Cuervo's superior. (The name Alburquerque dates from the time of Romans in Spain. Albaquercus was the name of a town in Spain and comes from the Latin words *albus quercus*, which means white oak. The name of the town, like the duke, had two Rs, but one was dropped after the United States took over in 1846 because the Americans could not pronounce the name with the first R. By the 1880s, the original spelling was no longer used.)

The governor had previously announced a new villa in the province and invited settlers to move to the area. People from the Bernalillo area responded, but because of raids by Navajos and Apaches, they would not have come without protection. Gov. Cuervo posted ten soldiers, who moved here with their families.

The soldiers were: Captain Don Martín Hurtado, Juan de Pineda, Francisco García, Pedro de Chávez y Durán, Andrés de Montoya, Sebastián de Canseco, Antonio de Silva, José de Salas, Tomás García, Xavier de Benavides.

Some of the first families were those of Cristóbal Jaramillo, Juan Barela, Francisco Candelaria, Feleciano Candelaria, Nicolás Lucero, Baltazar Romero, Joaquín Sedillo, Antonio Gutiérrez, Cristóbal Barela, Pedro López y Castillo, Doña Bernardina Salas y Trujillo, and Juana López y Castillo.

The governor wrote his superiors that great progress had already been made. Thirty-five families (252 adults and children) already occupied the town, he said. The settlers had completed their houses, built corrals, dug irrigation ditches that were full of water, and that their first crops had been planted – all without any expense to the Royal Treasury. The town, he said, was well planned and in good order. The *casas reales*

(government buildings) were under way, there was a large church, and a formal founding ceremony had been conducted.

Cuervo wanted his superiors to know that he had followed the procedures for the establishment of new villas set down in the *Recopilacion*, the book of statutes that governed the conduct of colonial officials.

Three days later Cuervo wrote the viceroy that he had followed all royal laws in establishing the Villa de Alburquerque. He wrote, "I do not doubt, very excellent lord, that in a short time this will be the most prosperous Villa…"

Ambitious Bureaucrat

In his zeal to found the new villa, Cuervo failed to ask permission from the viceroy and, through him, the King of Spain. He had also forgotten to file the necessary papers to obtain a land grant for the new villa. It was a poor political move for a governor, let alone an acting governor, to designate a settlement a villa, an administrative center and the second highest category of town without permission.

This was not his only mistake. He had also chosen as patron saint San Francisco Xavier. The duke was displeased. He had received a recent order from Madrid that the patron saint of any new settlement in New Mexico would be San Felipe, patron saint of the new sovereign, King Felipe V.

Cuervo appointed the soldiers' captain, Martín Hurtado, to serve as the first *alcalde*, or mayor. And it was Captain Hurtado who assigned the families their land during January 1706 and who conducted the founding ceremony the next month on February 7. There are no records of the ceremony, but customarily colonists pulled up grass, threw rocks in the air and shouted, "Long live the king!" It was recorded some time later that the settlers had sworn an oath when they took possession of their lands.

Cuervo didn't get his wish. Instead he was replaced by José Chacón, the Marqués de la Peñuela, who literally bought the New Mexico governorship from the king. In 1707 Cuervo returned to Mexico City where he worked in the colonial government until 1712.

Investigation

At that time it was common practice to review the tenure of Spanish colonial officials after they left office. In 1712 officials looked into the records of Cuervo's 28 months in New Mexico and raised questions about his founding of the Villa of Alburquerque. Had the villa been legally founded? Were there 35 founding families?

When Governor Flores Mogollon received the royal *cedula*, or decree, from Madrid he appointed General Juan Paez Hurtado to carry out the investigation. His judicial inquiry at the Villa de Alburquerque on October 21,1712 recorded the following statement from Pedro Acenzio Lopez:

Question: Was he one of the founding citizens of the villa, which was settled by order of Don Francisco Cuervo?

Lopez: That was true. He had joined with his father, Pedro Lopez, when the governor founded it.

Question: How many persons were in his family?

Lopez: Five.

Question: Did he know the total number of founding families?

Lopez: There were 19 original families, plus the ten soldiers, with their women and children, who served as guard for the vicinity. The 19 families at the time comprised 103 people, not counting dependents of the soldiers. Now they totaled 129 people.

Question: Had the said Don Francisco Cuervo provided them any government aid (ayuda de costa) at the founding?

Lopez: He knew of none.

Question: Had the villa been established in proper form with streets and a plaza?

Lopez: He and the other settlers had moved into the houses abandoned by the Spaniards in 1680, occupying the same estancias and farms. What was called the villa stretched for more than two and a half miles (one league) from the first house to the last.

Question: Were there now any families here beyond those settled by Don Francisco Cuervo?

Lopez: Yes. Seven additional families with 22 people.

Pedro Lopez then declared that he knew no more about the matter and was dismissed.

Captain Fernando Duran y Chavez, asked if Albuquerque had been lawfully formed with streets and a plaza as his Majesty required, responded that the villa was the same as it was, with residents living in homes built before 1680. The homes were scattered for a league from the first house of Baltasar Romero on the north near current Ranchos de Albuquerque to the home of Pedro Lopez, the last house on the south below present Central Avenue. He replied that all this area was "*en mucha alameda*," heavily wooded. He also reported that it was by the authority of Governor Cuervo that the pre-Pueblo Revolt estancias and farms were given to the settlers.

The Real Story

What apparently happened is that 19 families migrated to the Albuquerque area upon learning that ten soldiers would be stationed here. They probably didn't come as one party but in small groups. On arrival they were assigned individual land grants. Many of those, especially the 12 families Juan Candelaria mentions as coming from Bernalillo, were actually reclaiming properties that had belonged to their families before the Pueblo Revolt of 1680.

All households apparently received private grants of farm and ranch land. There is no evidence that any family was enrolled as a member of the community grant alleged to have been made to the villa of Albuquerque. As the 1712 investigation revealed, Albuquerque was not the usual compact village but, rather, a collection of farms spread along the Rio Grande.

The commission of inquiry found that Cuervo had provided land and pre-Pueblo Revolt houses and farms to settlers who came in small groups from other settlements. He did not have the 30 families required by Spanish law for establishing a royal villa. There was no plaza. There were no government buildings. There were no surveyed streets. The church was far more modest than the acting governor had declared.

At the close of the inquiry the viceroy reviewed the proceedings and agreed to let stand Alburquerque's designation as a villa. Cuervo had stretched the truth, but Spain needed an administrative center in the *Rio Abajo,* or the lower river area.

Besides, Alburquerque was in a good location, its settlers were hard working people, and the village had excellent prospects for the future. No charges were brought against the former acting governor; blatant exaggeration and self-promotion by civil servants and politicians were not uncommon. And on the frontier, the Crown tolerated some irregularities in its new colonies.

Resources:

Sanchez, Joseph. The Rio Abajo Frontier, 1540-1692.

Simmons, Marc. Albuquerque: A Narrative History.

Simmons, Marc. Hispanic Albuquerque 1706 – 1846.

The Albuquerque Museum. The Founding of Albuquerque.

Lesson Plan 1: Founding of Albuquerque

Estancias in the Cottonwoods

By Marilyn McGee

New Mexico Standards:
Social Studies, History: Students are able to identify important people and events in order to analyze significant patterns, relationships, themes, ideas, beliefs and turning points in New Mexico.
Benchmark: Describe how contemporary and historical people and events have influenced New Mexico communities and regions.
Performance Standard, 4th Grade: Identify important issues, events and individuals from New Mexico prehistory to the present.

Objective: The student will become familiar with the people, the facts, the sequence and the events that occurred when Alburquerque was established in 1706. The student will demonstrate this knowledge by completing one of the follow-up activities listed in the procedure section.

Grade: 4th

Group Size: Whole Class

Duration: Two class sessions: one for story and one for discussion.
Additional days depending on activity: two to seven days.

Setting: Classroom, library

Materials:

- Teacher's Copy: "Estancias in the Cottonwoods, The Founding of Albuquerque"
- Costume: Teacher to dress like Don Francisco Fernández de la Cueva , the Duke of Alburquerque
- Tag board for chart, or chalkboard, or overhead projector and materials for it.
- Writing paper, drawing paper, colored construction paper
- Pencils, crayons, colored chalk
- Poster board
- Colored markers
- Tempera paint
- Butcher paper
- Scissors and glue

Procedure:
1. The teacher will dress up as the Duke of Alburquerque, who was the Viceroy of New Spain from 1702 to 1711. (See attached illustration for ideas)
Variation a:. The teacher will assume the role of a storyteller without costume.

Variation b: The teacher will provide copies of "Estancias in the Cottonwoods" for each student and supervise the oral reading of the material, or read the story aloud to the students.

2. The teacher will tell the story of "The Founding of Alburquerque" from the viewpoint of Don Francisco Fernández de la Cueva Enriquez, the Duke of Albuquerque pretending he had just received the letter written by the acting governor of the province of New Mexico, Francisco Cuervo y Valdez, telling glowing accounts of the founding of the Villa de Alburquerque. The teacher could then switch roles, just by changing hats and become General Juan Paez Hurtado, the man appointed to carry out the official investigation at the Villa de Alburquerque on October 21, 1712. This exchange, or conversation would show General Hurtado reporting the facts in a straightforward manner, while the Duke of Alburquerque, who is telling his side of the story, appears to be very upset with Governor Cuervo.

3. The teacher will lead a discussion in which the students talk about the establishment of Albuquerque," emphasizing the major facts of the event and the sequencing of those facts. During this discussion the teacher will record the sequencing of the events on a chart, a chalkboard, or on the overhead projector to maintain a record of the discussion.

4. The students will demonstrate their knowledge of "The Founding of Alburquerque" using the chart, chalkboard list, or the overhead list to help them sequence, and recall the major facts by choosing one of the following activities.

a. Write a story pretending they are Don Francisco Fernández de la Cueva Enriquez, the Duke of Alburquerque, or pretending they are General Juan Paez Hurtado, telling the story of "The Founding of Alburquerque."

b. Draw the sequence of events telling the story of "The Founding of Alburquerque" onto an eight panel comic strip like form. (Make this form by cutting a 12-by-18-inch sheet of drawing paper in half lengthwise and then folding the long strip in half, and then in half again until 8 panels appear – four panels on the front of the paper and four on the back.)

c. Two students or more, working together, could draw the sequence of events for the story of "The Founding of Alburquerque" onto panels made from poster board cut into 12-by-12-inch pieces. At least 8 panels should be used. These could be posted together in sequence so that the story is told. The students could add comic strip-type balloon captions to help tell the story. The panels could be painted with paint, or colored with markers, colored chalk, or crayons.

d. A mural could be created by the whole class depicting the major events of the story of "The Founding of Alburquerque." The students could draw the sequence of events and then paint, or color their mural with markers or colored chalk.

Colored construction paper could be used to make the various figures, animals, buildings, water, houses, trees and grass. Written captions could be added to help tell the story.

e. A book could be written and published about "The Founding of Alburquerque," and pictures could be drawn and colored by individual students or teams of students, which would include the sequence of events of the story of "The Founding of Alburquerque."

Evaluation:
The evaluation of each student will depend on how the student demonstrates his/her knowledge of "The Founding of Alburquerque" through the completion and quality of the follow up activity the student has chosen to do. The completed product from the follow up activity should include at least 8 specific facts, events or understandings that the student has learned. A simple rubric (see the following lesson plan) could be constructed to evaluate each specific activity.

Extension:
1. Field Trip to the Albuquerque Museum where a docent will tour the students showing the artifacts from their collection, while describing "The Founding of Albuquerque."
2. Research clothes the people wore in Albuquerque in 1706. See "Señor Cisneros Draws On History," by Kathleen Raphael, illustrated by Jose Cisneros found in New Mexico Magazine**,** March 1994, pp. 30 – 39.
3. Research the tools, both household and farm, that the people of 1706 used. The Albuquerque Museum has many examples of these.

Resources:
See "Estancias in the Cottonwoods: Founding of Albuquerque"

Lesson 2: Founding of Albuquerque

Collage of Albuquerque, 300 Years

By Tonie Mendez

New Mexico Standards:
Strand I, Reading Process: Students employ appropriate reading strategies to read and interpret increasingly complex texts for a variety of purposes.
Strand II, Reading Analysis: Students respond to, examine, and critique historically and culturally significant issues and events portrayed in literature that both illustrate and affect people, society, and individuals.
Strand VI, Research: Students conduct and compile research data, synthesize findings, and develop an original conclusion to increase personal and community depth and knowledge.

Objective: Students will learn how to use technology to research information on people, places, and art that have made Albuquerque a unique place. They will be able to pull out important facts that will give a brief descriptive paragraph about their topic to put on a collage board to be displayed for all to see.

Grade: 4th

Group size: Small groups of 2 or 3

Duration: One hour daily for 5 days

Setting: Classroom, computer lab

Materials:

- Computers
- Paper and pencils
- 4 to 5 poster boards to mount information for collage
- List of suggested topics

Background: Review through discussion the history of Albuquerque using the information found in "Estancias in the Cottonwoods – The Founding of Albuquerque." Then discuss what Albuquerque is like today and how the students think it became this way.

Set-up: Discuss the above information on Albuquerque and the students' prior knowledge and go over the Rubric (evaluation standard) of what is expected and how the student will be graded on this project. Discuss how the student will go about researching using the computer and Internet to obtain the information.

Procedure:

1. Put students into groups of 2 or 3.
2. List subjects available for research.

3. Let students select their choice of topic.
4. Begin research, find information on computers.
   www.albuquerque300.org
   www.NASA.com
   www.cybergate.com
   www.Worldbookonline.com
   http://www.albuqworldwide.com/
   www.travelyahoo.com
   www.oldtownalbuq.com
   www.kirtland.af.mil
   www.sandia.gov
   www.unm.edu
   http://www.balloonfiesta.com
5. Print out information, then work together in their small groups, to pull out important information to use for collage.
6. The teacher needs to check the information before the final typing. This checking will ensure that information is sufficient.
7. Type out information using Apple Works, or Microsoft Word to list information in bullet form.
8. Find pictures on their topic both past and present.
9. The teacher will again check the information, this time for the correct use of grammar, spelling and form.
10. Print out the information and the pictures.
11. Cut out pictures and the typed information to fit on the collage board.
12. Mount the collage on poster board.

Evaluation:
The teacher may use the following rubric for evaluation.

RUBRIC

Title	5 points
Pictures past and present	5 points
Important Dates: beginning / end	10 points
Information Notes:	
When	
Where	
Who	
What happened	40 points
Typed Information:	
Organized	
Correct grammar / spelling	
Correct bullet form	
Facts – more than 7 less than 35	30 points
Final: Mounted onto poster board	
Neatly	10 points
TOTAL	100 POINTS

Suggested Topics to Research

Duke of Albuquerque

Zebulon Montgomery Pike

Santa Fe Railroad

Fred Harvey

Buffalo Soldiers

Sandia Tram

Sandia National Laboratories

Coronado and Winrock Centers

University of New Mexico

Zimmerman Library

Albuquerque Public Schools

Indian Pueblo Cultural Center

Old Town

San Felipe Church

Rio Grande Zoo

Native American Pueblos and Art

Chevy on a Stick

Balloon Fiesta

Camino Real

New Mexico State Fair

Kirtland Air Force Base

Hispanic Life in Early Alburquerque

Albuquerque, during the first century after its founding, witnessed sporadic episodes of high drama: Indian attacks and reprisals, violent quarrels among the colonists, famines, and plagues. But behind such troubles flowed the quiet, unsensational stream of ongoing daily life that characterized all New Mexican communities in the days of Spain's colonial rule. -- *Marc Simmons*, Hispanic Albuquerque 1706-1846

Life in Spanish Colonial Albuquerque from 1706 through the mid 1800s reflects people's struggles to survive -- raising crops and farm animals, coping with disease and injury without doctors, defending against raids by Navajos and Apaches, and doing without niceties or manufactured goods.

Early Years

Long before the founding of Albuquerque in 1706, Spanish settlers were already in the area. On the site of Albuquerque lived Francisco Trujillo, and the area was known as the Bosque de Doña Luisa, named for his wife. There were several dozen estancias by the 1660s. Their residents attended church at the pueblo missions and traveled occasionally to Santa Fe.

Like other settlers, they were driven out or killed during the Pueblo Revolt of 1680. Some of the occupants returned in 1693, after the Spaniards reclaimed the area.

Initially the Spanish government provided food and tools while the settlers got re-established, but in 1698 the royal treasurer declared that the New Mexicans should now sustain themselves. This decree coincided with a severe drought, which lasted until 1704. As streams dried up, pastureland turned to dust and crops withered. Both livestock and people suffered.

At the invitation of the governor to join the new Villa de Alburquerque, additional settlers came from Bernalillo in 1706 and set to work establishing farms up and down the Middle Rio Grande Valley.

The grove of cottonwoods was an important resource. It provided fence posts, corral poles, timbers for houses, wood for tools, and it was a good fuel. Because of heavy use, the bosque in time became depleted, and settlers had to travel farther and farther for their wood.

What did the people look like? Ranchers wore big hats, silver buttons on their clothing and a bright sash at the waist. Less wealthy men wore loose-fitting shirts and trousers made of the locally produced white cloth, *sabanilla*, or *gamuza*, tanned skins of deer or elk. Younger women wore blouses and skirts, and older women added to that a black fringed *tápalo*, or shawl. They all wore *teguas*, a hard-soled moccasin.

Farming and Ranching

They raised corn, beans and squash, as the Pueblo people did. They also brought plants and seeds from Spain, including cabbage, onions, lettuce, radishes, apples,

peaches, apricots, grapes, cantaloupes and watermelons, plus such grains as wheat and barley. Crops that came up with settlers from Mexico were chile, tobacco, Mexican beans and the tomato. And they brought a new variety of corn with a long cob and white kernels.

The pueblos had irrigated agriculture, but the settlers expanded irrigation into a network of *acequias,* or irrigation ditches. The main ditch, the *acequia madre,* siphoned water from the Rio Grande several miles above the villa and carried it to tributary ditches that ran to individual fields. They used the ditches for drinking water, bathing, laundry, and livestock water.

The horses, cattle and *churro* sheep the Spanish brought adjusted well to the Southwest and provided an economic base. Sheep in particular were a staple. Not only did they provide food, but their wool could be sheared, carded and made into yarn and then woven. And they were difficult for raiding Navajos and Apaches to stampede.

Sheep ranchers used the *partido* system, in which a shepherd (*partidario*) contracted with the owner to pasture and herd the sheep in exchange for a share of the increase. He could provide for his family from the herd but also had to make up for losses to Indians and predators. By the mid-1700s, a herd might have 1,200 sheep and 100 cows. By 1800 herds numbered in the thousands. There was little cash, so sheep became the unit of exchange, at a rate of one or two pesos per animal.

By the 1750s farms were yielding good crops of corn, wheat, chile, squash, beans, onions and the native tobacco (which they smoked in cornhusk cigarettes). There were also excellent vineyards and orchards of peaches, apricots, plums and apples. The residents raised enough for their own use and traded any surplus at nearby pueblos or in Santa Fe. The economy was based on barter because money was scarce.

Trade

The Crown prohibited trade outside the Spanish realm, but settlers maintained regular trade with the Apaches, even though they were often at war, and this love-hate relationship came to be accepted. They also traded illegally with the Utes as far north as the Great Salt Lake. In fact, some Spanish settlers carried loads of trade goods east to the plains and west to Utah and searched out the Apaches and Utes. The Spanish governor attempted unsuccessfully to regulate this trade.

Albuquerque was on the 1,500-mile route between Chihuahua and Santa Fe called El Camino Real de Tierra Adentro, or the Royal Road of the Interior. For over 300 years it was the lifeline between the frontier and Mexico. Over it passed governors, settlers, mail couriers, priests, and merchants. It also became a conduit for language, culture, religion and trade.

Merchants traded New Mexican blankets, woven cloth, corn, piñon nuts, buckskin, and buffalo robes, for manufactured products from other Mexican provinces. Every year in November, a convoy left for Mexico bound for Ciudad Chihuahua. Anyone with goods to sell would rendezvous in Alburquerque, and a military escort rode with them down El Camino Real. Every year at that time the village plaza must have been a lively scene. Alburquerque also contributed some of its militimen to serve as guards or escorts for the caravans.

Albuquerque’s leading commodity was textiles, and weaving was as important as farming and stock raising to the village economy. By 1790 there were 47 weavers, 25

carders and 15 spinners. Cobblers formed a smaller cottage industry, selling New Mexican footware.

But the merchants in Chihuahua knew they had captive buyers, and the Albuquerque traders didn't fare well in this exchange. The Spanish government tightly controlled the export of products, grain and cattle because they feared the New Mexicans wouldn't have enough to sustain them. The result was to depress the local economy.

Daily Fare

Their diet included beef, mutton, pork, fowl and game. They traded jerked buffalo meat from Plains Apaches. They ate fruit in season and dried it for later use. Fideos, bread, vegetables of all kinds were also common. Corn appeared in everything from soup to dessert. Beans were eaten with every meal. Only the rich could afford sugar, coffee and chocolate, but everyone grew chile. Cooking was done in open fireplaces or *hornos*, outdoor ovens. And they enjoyed wine made from local grapes, as well as brandies made from peaches and apricots.

Role of the Church

At its founding, Albuquerque had a small church named San Felipe de Neri Church, which recorded its first baptism on June 21, 1706.

The Spanish Colonial period was a difficult time for the settlers. Along with poverty and hardships, they lived with the fear of Apache raids. But through all this they were guided by their great faith. The church provided a road map for the settlers' lives, starting with baptism of infants. Throughout all the life cycles, there were numerous occasions when the settlers would ask for and receive special blessings. For example, six weeks after a woman had given birth she would present herself at the door of the church for a special blessing. And before starting a journey, people asked for a blessing for a safe trip. On their return, they would go to church and give thanks for their safe travel.

Celebrations and fiestas always began at the church, usually with a procession. The settlers' homes displayed *bultos* (carved wooden figures) and *retablos* (paintings) of saints and other religious articles. The people looked to the church for guidance, forgiveness, and council.

Education and Training

In early Albuquerque, children received a great deal of training from family members in the skills they would need. Priests provided the only formal education, teaching some children, as well as Indian people, to read and write.

Along with skills needed to farm and keep livestock, people learned blacksmithing, metalworking, woodworking and furniture making. Another skill, which would become one of New Mexico's most profitable industries, was weaving. Families carded and spun wool and wove textiles on hand-made looms. Sheep and wool became so prized that during the Pueblo Revolt of 1680, rebellious Pueblo people herded the sheep away rather than destroying them, as they did nearly everything else left by fleeing Spaniards. Subsequently, Spanish descendents and Native Americans alike developed their own textile traditions.

Blacksmithing and metalworking were extremely important to settlers, as everyone needed tools, implements, cooking utensils, bits, bridles and weapons. They

also fashioned religious items for Mass and crafted jewelry. Iron and metals were scarce, and so objects were often reworked or melted down and made into other necessary items.

Health Care

Because medical doctors were almost nonexistent during the Spanish Colonial period, the health-care providers were members of the community. *Curanderas* (female healers) or *curanderos* (male healers) had a gift for healing. They cared for expectant mothers, the injured and the sick. Often skills were handed down through generations within a family, while others served as apprentices to non-related healers.

Many women healers specialized. A very important specialty was being a *partera* (midwife) in home deliveries. It was not unusual for a special bond to develop between the mother in labor and the *partera*.

Sobadoras were similar to chiropractors of today. They healed with massage, manipulation and adjustments of the spinal column. If someone fell off a horse and sprained a limb or twisted his back, he went to the sobadora for relief. If someone was suffering headaches or great stress, a massage might help ease the pain. All healers had the respect of the community.

What did curanderas or curanderos use for medication? They had access to some imported medicines that arrived on El Camino Real. *Alhucema* (lavender), used for headaches and stomach conditions, was imported from Spain; European tansy mustard was employed as a remedy for cramps and fevers.

They also used native plants. These herbalists, or *herbolarias* , knew the power of each distinct plant. It might be the root, the stem, the leaves, the seed or the flower that brought relief to the sick. Most of these herbs were gathered and hung from the healers' vigas to dry before being stored. When needed, they might be crushed, boiled and drunk as a tea, while other plants were eaten fresh. Still other plants were applied to the sick or injured directly in a poultice.

Native healers were no match for some diseases. Children died from measles, and the common cold and respiratory diseases were widespread. People took their water from irrigation ditches and sometimes contracted dysentery and typhoid.

The most deadly disease, however, was smallpox. Outbreaks claimed lives about every ten years. In 1805, 87 percent of 6,930 Albuquerque residents had contracted smallpox at some time, and many faces carried scars from the disease. Young women sometimes attempted to mask their scars by dusting flour on their faces.

After a cure was discovered and a vaccine distributed, Dr. Cristóbal Larrañaga, the military surgeon from Santa Fe, began vaccinating Albuquerque children in the early 1800s. (Surviving adults were immune.)

Homes

Homes and buildings were adequate for the time and place but far from luxurious. Structures were single level and made of adobe because clay, sand, straw and sunlight were readily available.

The homes were small; one-room houses were not uncommon. Later, they might add one room at a time. Each room had its own entrance from the outside; inner doors were rare. Windows were small and built high on the wall, as much for defense against

Indian attacks as light. Because glass was not available, they covered windows with skins when the weather was bad. The floors were earthen. Later, brick was also used.

In the early colonial period, most houses did not have separate bedrooms. Instead, one large room served as kitchen and bedroom. A *colchon*, (a bedroll of buffalo hide or sheepskin or mattress stuffed with wool) was rolled up and placed along the wall, where it provided seating during the day and was unrolled for sleeping at night. Fabric nailed to walls kept sitters from getting whitewash on their clothing. Outhouses were common.

One room served many purposes. It was the living room, the kitchen and the bedroom. Food was prepared and eaten in the same room. The room was not cluttered with furniture that was not an absolute necessity. A corner fireplace was used both to heat the house and for cooking. Shelves held necessary items or food. Adobe benches built along the walls were common.

Domestic help wasn't hard to come by. In those days, Navajos, Apaches and Hispanic settlers made war on each other, and captives became slaves.

The more affluent settlers eventually had larger, hacienda-style houses with multiple rooms that served specific functions. They had furniture imported from Spain or Mexico. Some simple furniture was made locally. Pine was the wood of choice because of its availability. In the beginning designs were simple and straight. As time went by, craftsmen began to carve designs on cupboards, chairs and other furniture.

Settlers made their own adobes from thick mud mixed with straw and ashes. Using a wooden frame or mold that was open at the top and bottom, they produced adobes 18 inches by 10 inches by 5 inches. Then they removed the frames and left adobes on the ground to dry. They used stones for the foundation. Thick mud was also used to bind the adobes to each other and to the foundation.

With the walls up, the roof was raised. Vigas (beams) were placed about 24 inches apart across the walls. They started by using the larger logs at one end and working down to the smaller ones. This gave the roof a slight angle, necessary to make sure that the water would drain from the flat roof. The ceiling was built by placing straight branches, called *latías*, across the beams. These were then overlaid with reeds and followed by a cap of several inches of dirt. (Little has changed in building an adobe home other than using concrete for the foundation and boards to cover the vigas.)

Both men and women worked to build their homes. The men usually did the heaviest work while the women plastered the walls inside and out, using clay.

Over time, rooms of larger houses were built around a courtyard, or *placita*. Behind the house was a corral. For defense, the whole complex was enclosed within high adobe walls with no windows or doors and only two sets of gates. The front gate opened to a *zaguán*, a covered passage wide enough to allow a wagon into the placita. This allowed a wagon under attack to drive right into the enclosure. The rear gate opened to the corral.

Sometimes several families built a line of rooms and connected them around a plaza to form a fortified community.

After the railroad arrived and began bringing in new materials, the natives adapted, adding a brick coping at the top of an adobe wall, which kept it from eroding; using commercial plaster, which lasted longer than adobe; acquiring doors and windows from sawmills.

Security and Military

During Albuquerque's early years, the settlers were not safe from Indian raids. Originally, 10 soldiers were assigned to the villa.

Sixteenth century soldiers wore partial body armor and helmets and carried harquebuses, crossbows and swords. The harquebus, a fire-lock gun, gave them a greater range than the Indians' bow and arrow, but the firing mechanism was fragile and clumsy. Riding horses, which were also armored, they must have presented quite a spectacle to the first Pueblo people who greeted them. By 1706, flintlock muskets were more in vogue as were heavy, multi-layered leather jackets for armor.

Attacks by Apache and Navajo raiders continued; later, Comanche attacks began. Because the Villa of Albuquerque in this period was actually a string of farms covering a distance of two and a-half miles along the river, defense proved nearly impossible.

In 1708, the governor moved Albuquerque's 10 soldiers to Santa Fe, which left the settlers to protect themselves. They organized a citizen militia, and Pueblo men often joined them. Albuquerque became a staging point for campaigns against hostile Indians in the area. The church square was a parade ground where volunteers and soldiers could muster. Volunteers provided their own weapons, horses and mules and typically wore a padded leather vest.

In 1778, Don Juan Bautista de Anza was appointed governor. He reorganized the Spanish troops, including the citizens. He reduced the worst attacks by carefully assigning his soldiers. In 1779 de Anza organized an army of more than 600 men and defeated the Comanches in eastern Colorado. This reduced the Comanche threat, but because the military was stationed in Santa Fe, Alburquerque was still not a safe place.

Transportation

The horse initially gave Spaniards an advantage over others in the New World. But not everybody owned a horse. Many arrived here by *carro* or by foot. *Carros* were four-wheeled wagons commercially made for traveling and carrying freight long distances from central Mexico to the northernmost frontiers of New Mexico.

About every three years, supply caravans made use of carros coming to New Mexico. The *carreta* was a smaller, two-wheeled version of the carro, used for travel within New Mexico. It was made entirely of wood – even the wheels.

Communication

Communication between Mexico and Europe was often faster and more frequent than news between Mexico City and New Mexico. Because New Mexico was so remote, communication within the province took place along trails. Scouts and traders exchanged goods and conveyed news. They also communicated by marking on rocks and trees.

For Spaniards, the most important form of communication was the written word. They were meticulous at recording everything they did. Explorers documented everything. Many wrote in personal journals and sent them to officials in Mexico City, along with their reports. Records of expeditions included inventories of every person present and descriptions of towns and the area.

Also important were the cartographers who accompanied many expeditions. Maps communicated where they went, and where they were going. A map could also illustrate lands that, until then, were unknown.

Arts

Most early art, particularly painting, was created for churches, missions and home altars. The earliest churches, based on Franciscan missions in Mexico, were initially decorated with wall paintings and hide paintings.

Altar screens and *retablos* replaced these as they became more readily available in the 1700s and 1800s, when religious art was brought up from Mexico. Altar screens were built in tiers and could be taken apart and reassembled for easy transport. A *retablo* is a realistic image, usually of angels and saints, carved and painted on a rectangular board.

By 1750 the distinctive New Mexican artists called *santeros* had emerged. Using native pine and cottonwood, they created *bultos* (small statues) and *retablos*.

In the fall when the wheat had been threshed, New Mexicans had straw to use in making encrusted straw art. Wooden crosses and boxes were painted in colors of black, scarlet, or blue then with a pine varnish as glue, small pieces of flattened straw were applied in decorative patterns then sealed with a coating of the same pine varnish.

When tin cans became readily available, tin work became popular as an art form. Beautiful handmade tin work framed mirrors and paintings. Tin work, also used in lighting fixtures, was versatile as well as decorative.

Resources:

New Mexico Historical Review, April 1927.

Salaz Marquez, Ruben. Epic of the Greater Southwest, New Mexico, Texas, California, Arizona, Oklahoma, Colorado, Utah , Nevada.

Salaz Marquez, Ruben. New Mexico: A Brief Multi-History.

Sánchez, Joseph. The Rio Abajo Frontier, 1540-1692.

Simmons, Marc. Albuquerque: A Narrative History.

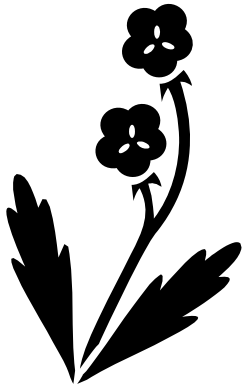
Sisneros, Jose. Riders Across The Centuries.

Udall, Stuart L. Majestic Journey: Coronado's Inland Empire.

Lesson Plan: Hispanic Life

Healing Plants and Our Connections to the Past

By Deborah Beer



New Mexico Standards and Benchmarks: Science Strand II (Life Science). Benchmark I – K-4 Social Studies 4th grade Strand, History. Benchmark I –A.

Objective: Students will learn about early Hispanic healers or *curanderas* and *curanderos* and some of the local plants used to cure illnesses. Students will connect their family history and stories of healing to the past. Students will examine, sketch and label common plants.

Grades: 4th

Group Size: 20-25 students. For sketching activity, small groups of 4–5 students.

Duration: 1 to 3 days.

Setting: Classroom

Materials:

- Copy of Carolyn Meyer's Rio Grande Stories, pp. 63–81 for Read Aloud
- Plants and herbs from grocery store or garden: cilantro, chamomile (manzanilla), spearmint, prickly pear cactus, rosemary Family Roots and Family Tree worksheets

Background: See "Health Care" section in Hispanic Life background report.

Preparations: You may want to begin reading Carolyn Meyer's book, Rio Grande Stories, as a Read Aloud before starting this assignment. It is a delightful Read Aloud for this age group and can provoke many thoughtful and interesting conversations. If you choose to only expose your class to pages 63-81, please read before presenting to decide if this would be appropriate for your situation. This chapter deals with a *curandera* and her ability to cure an evil eye or *mal ojo*.

Procedure: Day 1

1. After sharing the background information with the class, you might want to ask some of these questions leading to discussion of healers and home remedies:
   - Do curanderas exist today in New Mexico? Answer is yes. They can be found using alternative medicine sites and Women's Resource sites.
   - Do people use other types of medicines or cures to heal themselves?
   - Do any of our families have remedies that are unique to them?

2. At this point you will need to give examples of homemade cures that you may be familiar with or some that have been handed down through your own family. Here are two examples of my family remedies:
   - My mother is from Germany, and she would always treat our sore throats with a wool scarf soaked in vinegar. Then she would wrap this around our necks before going to sleep. Smelly, but effective.
   - We would be given peppermint tea to drink for upset stomachs. It also made throwing up less distasteful, if that's possible.

3. Read pages 63-81 of Rio Grande Stories aloud to class.

4. Making connections with our families and our history will be accomplished by making a family tree and handing out the worksheet My Family's Roots as homework. Review the page with students and have them write down any home remedies that they may discover on the back of the page. The second worksheet, the Family Tree may be sent home as homework. (You may need some alternatives for children in foster care.)

Procedure: Day 2

1. Students bring back completed Family Roots and Family Tree sheets. Questions for discussion:

- Where did family members come from? When? Why?
- How far back were you able to trace family members?
- Any interesting characters?
- Who were you named after?
- Did you find any homemade cures that have been passed down in your family?

2. After discussion you can take the opportunity for a writing episode. They can write about the process of finding information. Was it easy? Did they have trouble completing the chart? They may also choose to write about a relative or special family story. When students have completed writing, ask if anyone would care to share. This would be a good place to end the day's lesson, since the next portion may take at least an hour.
3. If you choose to skip the writing portion, this is the time to turn the lesson focus to healing plants.

Procedure: Day 3

1. Remind students that before modern medicine families often had to turn to local healers, medicine people or curanderas to help them with illness or injury. Much like the family histories of passed-down homemade cures, healers relied on local plants to care for people.

2. Divide class into 5 groups and provide blank drawing paper for students to sketch and label each plant.

a. Introduce the plants you will be discussing and drawing. Each of these plants is one that has been used for centuries for specific uses; these range from enhancing a food dish to aiding an illness.
b. Some have distinctive smells and tastes. Caution students not to put plants in mouth or taste them. They may smell the plants.
c. Before giving the names of each plant, pass them around and read the specific information on each plant. See if anyone can guess the name.
d. Students can sketch each of the plants as you introduce them if you have enough for each group to have their own sample.
e. If you only have one sample of each plant you can have a different sample at each group and then rotate the plants.
f. As students are sketching the plants write the plant names on the board along with what they are used for in healing. Students should include this information on page with sketch.

The following information was found in Healing Herbs of the Upper Rio Grande, written by LSM Curtain.

Cilantro

This plant can be used as flavoring in sauces. It was brought to New Mexico from Spain with the conquistadors when they began to explore the American Southwest. Early settlers used this plant boiled and drunk as a liquid to aid in toothaches and gum disease. For headaches, they would cover their heads, lean over a warm campfire or live coals sprinkled with a few cilantro seeds and inhale the fumes.
If your chicken had a cold, giving it a few seeds of cilantro "will cure them in no time."

Manzanilla, or chamomile
(Can be purchased at grocery store in dried form). This plant has been used as a cure for earaches when dried flowers are wrapped in a piece of cloth and warmed and placed on the ear.
When made into a tea it can help with a stomach ache, fever, colds or bronchitis.

Romero, or rosemary
This plant makes an excellent mouthwash and helps in digestion. A compress of the boiled plant wrapped in a cloth and placed on the stomach can drive pain away.

Yerbabuena, or spearmint
This plant is used for flavoring food and made into a tea for indigestion.
Wounds and sores can be cleaned with the tea. This tea is often given to mothers about to give birth to ease their nerves.

Nopal, or prickly pear
This cactus has been used by early settlers to treat cuts, bruises, wounds and swellings. First remove the sharp spines from the cactus lobe and cut into segments. Warm the segment and place the plant on the swollen area.
It also has a fruit which can be made into a jam or jelly. The lobes can be peeled, boiled, and fried to make a meal. The plant can also be fed to animals, such as cows.

Closure:
- All completed work can be put into a folder and taken home to share with family.
- Ask students to share what they have learned about home remedies and family histories passed down. (You can write these on the board.)
- Ask how they can connect these plants and their uses with people from the past.
- Can they think of any other plants or items that are used today that were used by early settlers in New Mexico or Albuquerque?
- Are there any traditions that they use in their own families that have been handed down?

Assessment
Teacher observation of class participation, completed work, writing sample, sketching.

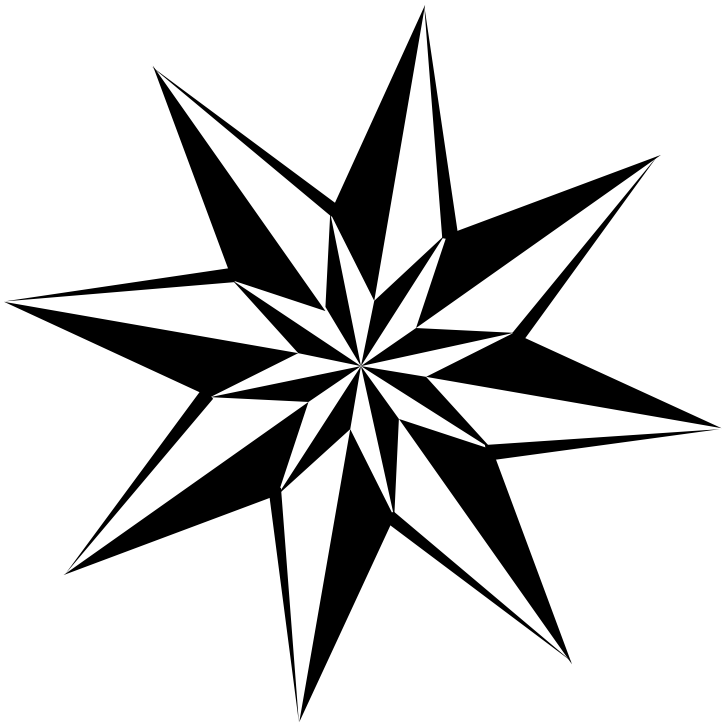
Extensions:

- Taking a nature walk in your neighborhood. Make observations about what plant life is around and how might it have been used by early settlers. Cottonwood tree "fruit" (the fuzzy cotton portion), was once used by dipping in water and applying it to an aching tooth or swollen gums.
- Albuquerque BioPark has a curandera garden, if you're going on a field trip. There are also free education programs available where they will bring the activity or lessons to your classroom. Call early, 6 weeks before needed. BioPark Education 505-764-6245
- Rio Grande Nature Center also has special classes and events. 505-476-3355.

Lesson Plan: Hispanic Life

New Mexican Tin Art

By Deborah Beer



New Mexico Standards and Benchmarks: Social Studies 4th Grade Strand – History, K-4 Benchmark I-A and I-C. Language Arts: Strand – Speaking and Writing for Expression, Content Stardard II, K-4 Benchmark II-C. Arts - Content Standard 6 – Visual Arts, A 1-4.

Objective: The student will learn about New Mexican tinwork and its history. They will work with heavy foil, tin cans or pie tins to create a piece of traditional tin art. The student will select and write about a chosen personal object or photograph to place in the tin frame artwork.

Grades: 4th

Group Size: 20-25 students

Duration: 1 to 2 days, depending which art lesson is chosen

Setting: Classroom.

Materials: See individual lessons.

Background

The indigenous people of Mexico were using tin for ornaments and other works when the Spanish arrived. The Spanish and Europeans had been using tin or tinplate all through the colonial period, also.

The first metal work in New Mexico was probably done by *plateros* (artists who worked in silver and gold).

The new material came to New Mexico over the Santa Trail after 1821. Among the commercial goods brought in to supply the U.S. military forts were foods in tin cans. Tinsmiths recycled these cans into common utensils to be used everyday and also into unique objects of art.

Tinsmiths' family workshops manufactured frames, nichos, sconces, crosses, and small ornamental boxes with beautifully finished surface designs reflecting a style unique to New Mexico.

New Mexican artists still use tin art or "poor man's silver" today, and it's available for purchase.

Questions for discussion:

- What type of artwork is made from tin? (Religious scenes, which were used to teach children family and community values, decorative frames, light fixtures, small boxes, etc.)
- Why did plateros begin using tin for art? (It was inexpensive material that was on hand. New Mexico was not near a distribution center for raw materials, so plateros used what they had.)
- What everyday objects might have been made from tin? (Eating utensils, candle holders, frames, cups, hair ornaments).

Set Up: Ask students to bring in samples if they have tin work at home. Or have some examples of your own.

Preparations: Each of these art lessons requires teacher or students to bring in some supplies. See individual lessons.

Lesson 1: Tin Art Frame

Preparations:

- Have students bring in large aluminum pie tins (you will need to cut out the bottoms to use). You may use heavy duty foil instead, if you wish.
- Have a discussion about what students will choose to put in their frames (it will be glued on). It may be a picture of a best friend, or a family outing, but it should be a meaningful selection, because students will be writing about their choices.
- Reading Selections: Poems from Gary Soto's Neighborhood Odes can begin a discussion on important things or people. These poems deal with everyday items such as "Ode to Mi Gato" and "Ode to Family Photographs."
- Other ideas may be a reading selection about a favorite relative or a gift given, such as The Bracelet by Yoshiko Uchida. This is a story about a little girl who goes with her family to an internment camp during World War II and the bracelet her best friend gives her.
- Discuss the type of designs that will surround their selection. New Mexican designs in tinwork usually consisted of flowers, leaves, stars, shapes, wavy lines, etc.

Materials for frame:

- Heavy duty foil or bottom of cut out pie tins
- Thin cardboard for frame (cereal boxes or poster board) cut into a square or rectangle
- Pen or pencil
- Popsicle sticks
- Glue
- Picture or object to put in frame.

Procedure:

1. Give each student a cardboard frame and a piece of foil or aluminum. Make sure there is enough foil to cover the frame.
2. Students can put foil over frame and lightly press along the edges so they have guidelines in which to draw on the foil.
3. Remove the foil from the frame and turn foil to the back.
4. The student will be drawing on the backside of the foil. Use a pen or pencil and remind them to press firmly, but don't rip the foil. The design becomes a relief on the metal. They can use a popsicle stick to puff out the design once it is drawn.
5. When the student is finished drawing the design, turn the foil over, check to see if any areas need to be filled in. Glue the foil onto the cardboard frame. Trim edges.
6. Glue or tape picture or object in center of foil frame.
7. Students will then write about the object or picture and its significance.
8. Ask for volunteers to share their work with class.

Lesson II: Tin Lanterns or Luminarias

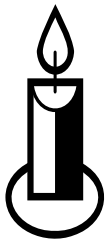
Preparation: This lesson can follow a reading of Rudolfo Anaya's book Farolitos for Abuelo. Discuss the different traditions we have relating to luminaries in New Mexico.

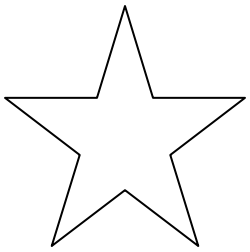
Materials:

- Tin cans (large fruit can or orange juice can)
- Hammer or a large rock that student has brought in
- Large nail
- Votive candle
- Sand

Procedure:

1. Students will hammer holes in the can, either in a pattern (which can be dotted lightly on can with marker) or make random holes.
2. <u>Don't put any holes in the bottom 1 ½ inch of can so sand can be placed without draining out.</u>
3. This can get loud and fingers can get smashed. A pad of wadded up newspaper will absorb noise and can steady can. If your can warps easily I have heard (but have not tried) filling the can with water and freezing overnight. This way holes can be made in can and the sides will not bend.
4. Once completed, students fill bottom of can and put in candle.
5. A handle can be made from heavy twine and attached to top. Take care it does not fall into candle flame.





Lesson III: Foil Mobile or Ornaments

Materials:

- Shapes cut from oak tag (leaves, stars, trees, etc)
- Felt tipped pens
- Aluminum foil
- Nylon string or yarn
- Small nail

Procedure:

1. Student will select 3 shapes precut from oak tag.
2. Glue foil over shape, trim excess foil from edges with scissors or fold and press down edges.
3. Decorate shapes with felt tipped makers.
4. Make small holes in shapes and thread string or yarn to hang the shapes vertically.
5. Make a loop at the top of string and hang from ceiling.

Lesson IV: Trinket Box

Materials:

- Small box with hinged lid, one per student. Altoid mint boxes can be used.
- Aluminum foil
- Glue
- Scrap cloth
- Yarn, string
- Optional – small beads or jewels
- Optional - liquid brown shoe polish

Procedure:

1. Each student should cut out scrap cloth to fit under side of lid and bottom of box. Glue cloth down.
2. Glue string or yarn in swirls and designs on top and sides of box.
3. Take small pieces of crinkled foil, and glue onto box, over the string designs. Take care not to foil or glue box shut.
4. Press down on foil with fingers to bring out designs.
5. Optional choices:

- Glue fancy beads or jewels on box to decorate.
- To give an "antique" look – apply brown liquid shoe polish over box and wipe off excess amount.

Resources:

Austin, Catherine. Making Country Classic Tinware. New York: Sterling Publishing, 1993.

Gavin, Robin Farwell. Traditional Arts of Spanish New Mexico. Santa Fe: Museum of New Mexico Press, 1994.

El Camino Real and the Santa Fe Trail

Trade Routes

In 1598 Don Juan de Oñate y Salazar set out from Santa Barbara, near present-day Chihuahua, Mexico with 600 settlers. Their destination was *el tierra adentro*, the interior land.

On April 30, Oñate claimed the region for Spain before crossing the Rio Grande near present-day El Paso. After 3 months they reached the Indian Pueblo they named San Juan. It was the first European community west of the Mississippi.

The 1,500-mile route Oñate traversed between Chihuahua and Santa Fe came to be called El Camino Real de Tierra Adentro, or the Royal Road to the Interior. For 300 years it was the lifeline between the frontier and Mexico, and over it passed governors, settlers, priests, and the occasional merchant. It also became a conduit for language, culture, religion and trade.

Soldiers and some settlers arrived here by horse, but some came by *carro* or by foot. *Carros* were four-wheeled wagons commercially made for traveling long distances from central Mexico to the northernmost frontiers of New Mexico. Supply caravans also made use of carros to transport goods to New Mexico. The *carreta* was a smaller, two-wheeled version of the carro, used for travel within New Mexico. It was made entirely of wood – even the wheels.

Merchants brought scarce manufactured goods to New Mexico and returned with piñon nuts, buckskin and woven cloth. When Albuquerque was founded in 1706, its location on the road contributed to its survival. The village became a popular gathering place along El Camino and provided a way to export the village's wool and textiles, Albuquerque's leading commodities.

Every November, by order of the governor, a convoy left for Mexico. Anyone with goods to sell would rendezvous in Albuquerque, and a military escort rode with them down El Camino Real. The merchants in Chihuahua knew they had captive buyers, and Albuquerque buyers didn't fare well; manufactured articles were scarce and the prices exorbitant.

After Mexico won its independence from Spain in 1821, the northern portion of the trail became the Chihuahua Trail.

One of the first developments after independence was an increase in trade. Americans had long wanted to trade with Santa Fe and the Spanish province of New Mexico, but Spain wouldn't allow it.

That year William Becknell, motivated by his debts in Franklin, Missouri, departed on a trading expedition. He intended to trade with trappers and Indians. On the way, he and his companions encountered Spanish dragoons. Expecting to be jailed, he learned instead that Mexico was now free of Spain; the soldiers encouraged Becknell to go to Santa Fe instead.

There he – and his trade goods – were warmly received. His profits inspired him to try again. A year later, with three ox-drawn wagons, Becknell forged a shortcut, called the Cimarron Cutoff. He and his men nearly died on the arid route, but it became the

most popular route between Independence, Missouri and Santa Fe. He was again successful, even selling his wagons at a steep profit.

So began the Santa Fe Trail. New Mexico was now connected to the outside world, and it was open for business. The trail would carry hundreds of traders and prospectors into New Mexico but not many settlers. It came to be called, appropriately, "The Great Commerce Road."

When Santa Fe gained access to trade, so did Albuquerque, as goods now moved south on El Camino Real and into Albuquerque.

One indicator of the increase in trade is a census taken in 1827. Traders in New Mexico numbered 93, where previously there had been few. Albuquerque's population grew to 2,547, up from 2,302 in 1821. Some of Albuquerque's land barons became traders, adding greatly to their wealth.

By 1830 trade was booming. Some wagons left the Santa Fe Trail even before reaching Santa Fe and rolled through Tijeras Canyon to Albuquerque. And with better access to Mexico, merchants often sent their trains south on El Camino without unloading in Santa Fe.

Despite its use, the trail didn't guarantee an easy journey. Travelers were at the mercy of hostile Indians, prairie fires, flooding rivers, blizzards, heat and thirst.

In "The Commerce of the Prairies" Josiah Gregg described a typical caravan of about 200 men – well dressed merchants, backwoodsmen in leather hunting shirts, farmers, and "wagoners," or teamsters. They were armed to the teeth with long rifles, shotguns, repeating weapons and knives of every description.

To make the inevitable repairs on wagons, they laid in a supply of timber for axle-trees and other parts before leaving Missouri because they would find no wood on the plains. Logs were lashed underneath wagons.

The journey began with the captain shouting "Catch up!" That meant, catch your mules and hitch them to the wagons. Each wagoner competed with the others to be the first one ready. Mules, being mulish, didn't always cooperate. Each teamster shouted "All's set!" until all were ready, and then the captain would yell, "Stretch out!" That launched a chorus of shouts, cracking of whips, moving of heavy feet, creaking of wheels and rumbling of wagons. Then the captain would yell "Fall in!" and the caravan, formed into a long line, would get underway.

The ten-week journey would guarantee Indian attacks, fears of getting lost or not having enough water, quarrels amongst the travelers, and wagons tipping over. At last, they rolled into Santa Fe, to the great joy of the tired travelers.

When Mexico ceded New Mexico to the United States in 1846, the Santa Fe Trail linked the United States with its new territory. The government built a string of forts to protect the trail, including Fort Union in 1851 in northeastern New Mexico.

The army established a supply post in Albuquerque, which was good for the local economy because it needed produce, meat and hay, which locals gladly supplied. Guadalupe Trail in the North Valley is named for land-owner Guadalupe Gutiérrez, who drove cattle and sheep along this trail from the North Valley to the army post.

Again traffic on the trail increased. An indication of volume is the record in 1858 of 1,827 wagons carrying $3.5 million in goods – including housewares, drugs, groceries, whiskey, hardware and ammunition. In time freight included furniture, musical instruments and heavy machinery.

The trip usually took two months each way, progressing about 10 miles a day, or 15 on a good day. Most freighters only undertook the trip once a year.

In 1847 a young French Canadian, Francois Xavier Aubry decided to find out how fast the trip might be made. In December and January, he cut the time to 14 days. In May 1848 he made it in 8 days, 10 hours. Aubry set a record that's never been broken in September, when he covered the distance in 5 days, 16 hours. He slept only a couple of hours and had to strap himself to his horse during the last two days. He wore out six horses and had to walk 20 miles. Aubry earned the title, "Skimmer of the Plains."

Beginning in 1849 with the first stage line, the trail also hauled passengers, bumping along in stagecoaches, and in this way many newcomers came to New Mexico. By the 1860s, there was daily service. Fare from Kansas City to Santa Fe cost $250 and included 40 pounds of baggage, two blankets and food. The trip took two bone-jarring weeks. The only opportunity to stretch was when the coach changed mules.

Each coach carried 11 passengers – 9 inside, three to a seat – and two outside. In an emergency, they packed in 14. The stage also carried mail. Food on the journey was typically hard-tack, bacon and coffee, unless somebody shot an antelope or buffalo. If they encountered a snowstorm, they simply had to sit it out. A hail storm was worse because it could stampede the mules, in which case passengers had to jump from the coach to save themselves.

A conductor, the forerunner of the flight attendant, stayed with the coach for its entire journey, collecting fares, tending to the passengers and taking responsibility for the mail.

When the railroad chugged into Albuquerque in 1880, the Santa Fe Trail became obsolete, although El Camino Real still saw local use. In 1905 the Territorial Legislature declared it the Camino Real Highway, the state's major north-south route. In 1913 it became NM 1.

Traces of the Santa Fe Trail can still be seen in northeastern New Mexico and near Fort Union. History buffs spend their vacations visiting sites along the trail and even have their own organization, the Santa Fe Trail Association. Congress declared the trail a National Historic Trail in 1987.

El Camino in modern times became U.S. 85 and, later, I-25 paralleled the old route. It's still the oldest European road in North America. Today El Camino Real is a National Scenic and Historic Byway, stretching between El Paso and San Juan Pueblo.

Albuquerque's original access to the eastern plains through Tijeras Canyon would serve it well when the federal government was choosing highway routes, first for Route 66 and later for I-40.

Resources:

Duffus, R.L. The Santa Fe Trail.

Gregg, Josiah. The Commerce of the Prairies.

Sánchez, Joseph. The Rio Abajo Frontier, 1540-1692.

Simmons, Marc. Albuquerque: A Narrative History.

Lesson Plan: Trade Routes

By Linda Spensley, Janet Saiers

New Mexico Standards:
Language Arts, Strand I: Students will apply strategies and skills to comprehend information that is read, heard, and viewed. Fourth grade: 1, 3, 4.
Mathematics: **Measurement:** Students will understand measurement systems and applications.
Social Studies, II-B: Distinguish between natural and human characteristics of places and use this knowledge to define regions, their relationships with other regions, and patterns of change.

Objective: Students will learn about the history of trade routes and their role in the commerce of the area now known as New Mexico.

Grade: 4th

Class size: Up to 24

Duration: Flexible (Do just the reading activity for one class period or all the activities for a week.)

Setting: Classroom
Teacher Note: The Albuquerque Museum is wonderful field trip and resource with authentic artifacts and information on trade routes.
(505) 243-7255, www.cabq.gov/museum
El Rancho de las Golondrinas (an early Spanish living history museum) in La Cienega outside of Santa Fe is another perfect field trip and resource for this subject.
(505) 471-2261, www.golondrinas.org

Materials:
- State maps or maps of different trade routes, such as El Camino Real or the Santa Fe Trail (one per two students)
- Rulers
- Dictionaries

Background Knowledge:
1. Ask students to brainstorm how goods get to their local stores and what is needed to support these different modes of transportation.
2. List their ideas on the board (semi trucks, trains, vans, roads, train tracks). Expand their ideas to include goods from other states and countries (ships, airplanes, Internet). How do we transport goods to the International Space Station?
3. Now have the students think about how goods were brought to Albuquerque in the days of the early settlers (wagons, horses, stage coaches, etc.) What were some of the obstacles? (No roads, changing weather, shelter needs, amount of

time it took to reach destinations, supplies needed for the trips, crossing lands occupied by different peoples.)

4. Discuss the differences in transporting goods due to advances in transportation and technology (invention of the automobile, the airplane, the Internet).
5. Help students come to the conclusion that trade routes in the early days were vital to the settlers in far away regions.

Activities: Choose one or two or use as a unit over a week or longer.

1. **Reading/Writing/History/Vocabulary**:
   a) The teacher reviews or students look up vocabulary words (a bit challenging, so omit words that are not appropriate for your particular students) before they read the article on trade routes. (This list can also be used for a spelling list and assessment.)
   b) Students partner read or choral read the article on trade routes and write a summary paragraph about the information.

2. **Math-Map Skills**: In pairs, students use trade route maps to measure distances from different points on the map to important landmarks, such as Chihuahua to El Paso, El Paso to Albuquerque, Independence, Missouri to Santa Fe, etc. Students can record their data and possibly convert miles to kilometers and other measurements of the period, such as leagues (about three miles).

3. **Research:** Students research the routes using Web sites and information from local libraries, The Albuquerque Museum, and El Rancho de las Golondrinas (see teacher note). They can explore where the trade routes were located in relation to modern cities, pueblos, landmarks, roads, and freeways.

4. **Field Trips:** The Albuquerque Museum, early settlements (Las Golondrinas)

Extension: Students explore the politics behind trade routes. Why did it take so long before goods from the United States were allowed into New Mexico? How did the Santa Fe Trail change the kinds of goods that were brought to New Mexico?

Assessments:

1. Students write a paragraph or more on why trade routes were important to the early settlers of Albuquerque.
2. Students take a spelling test on the lesson vocabulary words.
3. Students write a research report on the history of trade routes.
4. Students write about what the transportation of goods will look like in the future.

Resources:

www.cabq.gov/museum
www.discoveryschool.com
www.golondrinas.org
www.ped.state.nm.us

Vocabulary Words:

1. **MERCHANT**
2. **SCARCE**
3. **ARID**
4. **ROUTE**
5. **APPROPRIATELY**
6. **COMMERCE**
7. **BOOMING**
8. **CEDED**
9. **HAULED**
10. **FARE**
11. **BAGGAGE**
12. **OBSOLETE**
13. **DECLARED**
14. **PARALLELED**
15. **STRETCHING**

Vocabulary Words (With definitions loosely compiled and edited from *Scholastic Children's Dictionary, 2002.)*

1. **MERCHANT**: someone who sells goods for profit.

2. **SCARCE**: something that is hard to find.

3. **ARID**: extremely dry land due to a small amount of rainfall.

4. **ROUTE**: the road or course that you follow to get from one place to another.

5. **APPROPRIATELY**: suitable, or right.

6. **COMMERCE**: the buying and selling of things in order to make money.

7. **BOOMING**: growing quickly.

8. **CEDED**: separated from a government or country.

9. **HAULED**: carried, transported by vehicle.

10. **FARE**: the cost of traveling on a vehicle.

11. **BAGGAGE**: travelers' suitcases, bags, and trunks.

12. **OBSOLETE**: out-of-date and no longer used.

13. **DECLARED**: announced something formally.

14. **PARALLELED**: two straight lines that stayed the same distance from each other and never crossed.

15. **STRETCHING**: extending or spreading out as a highway.

Trade Routes

O E E O B P L R A N M H E F B W V M B U
P T L G B T D I W C K M P W U U P D H J
T E N F A S K W F C D S R T G M J Y E J
Z N G A G Z O A E D U H P R Y T T A X J
B S K P G X Z L Q S I W O J D J Q S Q M
O D T P A A D U E P M P X K E X J H D Q
W Y S R G H E W F T A M H J H I D U O E
E C I O E N D E C R E M M O C Z Q I E C
G D U P A T E F A R E C E Q Z A Z S T C
W X Y R M C C L C F O V H L E I A W I Y
D A Y I R I L H S E P V W F N K Q M D U
A B Q A W E A K I G K F G X C X I P R K
E D C T L N R B E N J G I K V R W V Y K
U S E E T P E V H I G V U W L Q W G V I
N K D L G N D T R M F N Z R B R P X K U
F N I Y U T D L U O R N R R C L V R O U
S J B Y L A W P F O B A J K E T E L D V
C F I A Q T H S E B R Q Q R V A N F B H
E B H O P K U T G S Z B Z T I Q Q A I O
I D V Y V V K P E Z F M S Z A Y W E M P

APPROPRIATELY
ARID
BAGGAGE
BOOMING
CEDED
COMMERCE
DECLARED
FARE
HAULED
MERCHANT
OBSOLETE
PARALLELED
ROUTE
SCARCE
STRETCHING

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Ownership and Settlement in Early Albuquerque
Land Grants

Native people and Europeans had vastly different outlooks on land ownership. Native people did not "own" land. They believed that the land belonged to their creator. After Spaniards arrived in New Mexico in 1540, they introduced the concept of land ownership.

The Spanish king or his representatives conveyed land to individuals, groups and towns through a system of land grants, or *mercedes*, in order to promote settlement on the frontier. Spanish authorities used the system in Florida, Texas, Arizona and California, but the oldest land grants are in New Mexico. There were more than 150 community land grants totaling 9.3 million acres awarded by first the Spanish and then the Mexican governments.

There were two kinds of grants – the private grant given to an individual, who was required to live on the land and improve it for four years before receiving title, and the grant to settlers for a new town. Members of the community grant could own a small piece of farmland along an irrigation ditch, but most of the land was held in common for grazing, wood cutting or other uses.

In New Mexico, land grants were issued to encourage settlement, to reward patrons of the Spanish government and military officers, and to create a buffer zone between Indian tribes and populated areas.

Spain also issued land grants to several Indian Pueblo groups who had occupied the areas long before Spanish settlers arrived. In the Albuquerque area the Spanish governor awarded grants to the Pueblo de Sandia and the Pueblo de Isleta. The Spanish also enforced the Four Square League law, which required that the land surrounding an Indian pueblo be allotted to that pueblo for one league in each direction from the pueblo. No grant could cover this land. This set up political and ethnic boundaries for the Pueblo Indians and helped sustain Pueblo cultures.

In New Mexico, there were two types of Spanish and Mexican land grants – community land grants and individual land grants.

Community land grants were typically organized around a central plaza, and each settler received an individual allotment for a household and a tract of land to farm; common land was set aside for use by the entire community. Spanish and Mexican law usually authorized the local governor to make such community land grants, and the size of each grant was at the governor's discretion.

Individual land grants were made in the name of specific individuals. Again, the governor could also make this type of grant.

Exploration and Settlement

The first Europeans to see the Middle Rio Grande Valley were soldiers led by Captain Hernándo de Alvarado, who were the advance guard for the explorer Francisco Vázquez de Coronado. Alvarado named the mountains the Sierra Nevada and the river the Nuestra Señora. The valley that stretched between was called Tiguex.

In 1598 Don Juan de Oñate entered the northern frontier of Nuevo Mexico to claim the territory for Spain. By the early 1600s a number of Spanish *estancias* (farms or ranches) dotted the area of the Rio Grande Valley between Sandia and Isleta pueblos. Spanish settlement came to a halt in 1680 with the outbreak of the Pueblo Revolt, when Spanish colonists and missionaries were driven from New Mexico. Twelve years later, Don Diego de Vargas reclaimed New Mexico.

Atrisco Land Grant

Long before "La Villa de Alburquerque" ever appeared on a Spanish map, settlers were farming and raising livestock at Atrisco, on the western bank of the Rio Grande. Its agricultural tradition continued at least until World War II, when descendents of these settlers contributed wool to make army blankets.

In 1692, the same year Don Diego de Vargas reconquered New Mexico following the Pueblo Revolt, the government of Spain granted 41,533 acres to Don Fernando Duran y Chávez in a place where his father, Don Pedro, once lived. The grant was payment for Don Fernando's services during the *reconquista*, the reconquest. Known as the Atrisco Land Grant, it was the first of more than 300 such grants in the Province of Nuevo Mexico and the first in what would become the United States.

The name "Atrisco" stems from a Nahuatl word "atlixo," which translates as "surface of a body of water." (De Vargas had Nahuatl Indian auxiliaries with him.)

In 1703 the provincial government recognized the small community of Atrisco settlers as a town, which is why Atrisco celebrated its Tricentennial in 2003. Atrisco was administratively supervised first by Bernalillo and, after 1706, by Albuquerque. Settlers built their *haciendas* along the Rio Grande. Here they grazed sheep and cattle on the lush grasses in the valley. They cultivated and irrigated land to grow corn, chile, wheat, squash, alfalfa, and beans.

By 1760 more than 200 people were living in Atrisco. As land disputes proliferated, settlers asked for and got another 25,958 acres. Atrisco now extended from the Rio Grande to the Rio Puerco, testimony to the abundance of grasslands in those days. They established a second village, San Ignacio, on the Rio Puerco.

A census for 1790 tells us that Atrisco had 12 ranchers and seven farmers; Albuquerque had 57 farmers and just four ranchers. "Given the high proportion of ranchers at Atrisco, it would not be amiss to suppose that the place was regarded as a 'prestige suburb' of Albuquerque," wrote historian Marc Simmons in *Hispanic Albuquerque 1706-1846.* Among the Indian images in the city's Petroglyph National Monument are crosses and livestock brands left by Atrisco ranchers.

Growth and development in the area during the 1800s didn't affect Atrisco; in fact, construction of the railroad in 1880 provided new markets to the Atrisco cattle and sheep growers. Atrisco thrived.

Other Area Land Grants

After Tiwa Indian people abandoned Alameda Pueblo, the governor in 1710 made a large grant of the land to Captain Francisco Montes Vigil as a reward for military service. Two years later he sold the grant to Juan González. (His extensive corrals on the other side of the river gave the village of Corrales its name.) Smaller grants were given to families for ranchos. They became the village of Alameda.

In 1712 a 70,000-acre grant was made to Captain Diego Montoya. Soon after, it was conveyed to Elena Gallegos, the widow of Santiago Gurulé. (In colonial New Mexico women often took back their maiden names when they were widowed.) The grant stretched from the southern boundary of Sandia Pueblo to the northern boundary of the Villa de Alburquerque and from the river to the mountains. After her death, the grant passed to her son, and after he died it was parceled out among heirs. Like other grants, it was divided into strips so that each strip had access to the river. In time some of the lands were sold, but the portion on the East Mesa and in the mountains was held and used in common. Anyone owning the smallest portion of land could pasture a flock there.

In 1982 the City of Albuquerque acquired the remaining 7,761 acres in one of the most complex transactions in city history. The city then turned it over to the U.S. Forest Service to be included in Cibola National Forest.

The portion of the grant in the North Valley soon held a group of farms known as Ranchos de Albuquerque. Other small settlements took the names of their leading families – Los Griegos, Los Montoyas, Los Poblanos and Los Gallegos. (Los Poblanos was named for the Armijo family, who had come from Puebla in Mexico after 1811.)

Another grant was the one made in 1762 to 19 residents of the Cañon de Carnué (Tijeras Canyon). They established a village at the mouth of the canyon.

Treaty of Guadalupe Hidalgo

In 1846 the United States and Mexico fought a war over boundaries, which ended in 1848 with the Treaty of Guadalupe Hidalgo. In this treaty the United States agreed to recognize land grants made by the Spanish and Mexican governments in New Mexico and five other western states.

The United States established a system to establish land ownership. The U.S. Surveyor General in New Mexico in 1854 would begin reviewing claims and was to make recommendations to Congress. After Congressional confirmation, deeds would be issued. The Surveyor General soon faced a welter of difficulties.

Land tenure and ownership patterns were very different in Mexico and the United States.

The American system viewed the earth's surface as an imaginary grid laid out on a piece of paper, and cartography and surveying were used to identify physical features of a particular parcel. Land was defined by range, township and section numbers. Each section was one square mile. The exact measurements of parcels were identified and located on a map, land ownership was primarily in "fee simple," land costs were influenced by the open market, no restrictions on transferring land existed, and land titles were recorded in local government offices. Taken as a whole, this system facilitated the use of land as a commodity that could be bought and sold.

By contrast, the Mexican and Spanish systems were based on a rural, community-based system of land holding prevalent in medieval Europe and not on fee simple ownership. Land was viewed more in its relationship to the community, although parcels could be sold to individuals after the land had been used and inhabited for a certain number of years. Land was used primarily to provide sustenance to the local population, rather than as a commodity that could be exchanged or sold in a competitive market.

The Mexican system of land ownership was referred to as *usufruct*, "use the fruits of the land, but do not own the land." Land boundaries were defined using visual landmarks (such as rivers or mountain peaks) or the adjoining property.

Systems of Land Ownership

American	**Spanish/Mexican**
Defined by range, township, section number	Defined by landmarks
Viewed as a commodity to be purchased	"Use value" more important than land value
Fee simple – no restrictions on transfer	Restrictions on who could own lands
Impersonal sales	Usually sold/given to family member or neighbor
Meticulous record keeping, recording of deeds	Few records, if any; no deeds

Compounding these differences was the fact that New Mexicans didn't speak English and were unfamiliar with the U.S. legal system and American culture. The Mexican legal system, for example, had consisted largely of Spanish and Mexican codes and laws that were often interpreted according to local custom and usage. More formal tribunals and courts did not play the same role in México as they did in the United States in interpreting and deciding issues and cases.

The situation was ripe for fraud, and scoundrels of all kinds slipped in to take advantage of the confusion and make claims. In some instances unscrupulous attorneys demanded huge fees to clear titles; when clients couldn't pay, they accepted payment in land.

At one point a New York City millionaire financed his brother to claim unconfirmed land grants. White Americans rode in and claimed the long-established ranch of Manuel B. Otero, La Constancia, while its owner was away visiting. On learning of this intrusion, he and his men rode for the ranch. As they approached, a voice called from the house, "Halt, or we fire!" In an exchange of gunfire, both Otero and the financier's brother were shot. Otero survived and presumably held onto his land.

The Surveyor General found that many boundaries could no longer be found. Some grants overlapped. Owners had lost their original papers. Ultimately the Surveyor General and later the Court of Private Land Claims ruled on 282 grants totaling 34.6 million acres. It rejected most of the claims.

By 1903 most of the land grant claims were sorted out, but many of the common lands were either divided among heirs or returned to the public domain. For this reason the U.S. Forest Service now controls acreage from former land grants, and heirs are still asserting their rights to this land. Controversy over land ownership continues to this day.

Despite the erosion of land grants, New Mexico still has 22 land grants of 200,000 acres.

In 2004 the Legislature passed a law recognizing land grants as political subdivisions, which allows them to accept state and federal funds. The Cañon de Carnué Land Grant members plan to use government funding for planning and zoning, utilities and economic development on a planned commercial development on their 900 acres.

The Atrisco Land Grant today

In 1892, after the Territorial Legislature passed a law allowing community land grants to incorporate, the 225 Atrisco descendents acted, and the Town of Atrisco became

a community land grant corporation, which validated its two land grants in court two years later. It was one of the first incorporated towns in New Mexico in 1892.

Atrisco avoided the fate of other New Mexico land grants, although for many years there were disputes between heirs.

In 1967 the Legislature allowed the Atrisco Land Grant to form a private corporation, Westland Development Co., to take over common lands, and heirs of the original settlers received shares in the company. Shares can only be transferred to other heirs. Today Westland manages about 57,000 acres of Atrisco's land holdings.

For over 400 years the *Atrisqueños* (Atrisco Land Grantees) have witnessed a number of economic and political changes, from the Pueblo Revolt to New Mexico's independence from Spain, and New Mexico's inclusion as a territory of the United States in 1846. Today, the Atrisco Land Grant is one of the oldest continuous existing land grants in the United States and one of the only Spanish Colonial grants still presently owned by the heirs of the original settlers.

Resources:

Cline, Howard Frances. Spanish and Mexican Land Grants in New Mexico, 1689-1848.

Ebright, Malcolm. Land Grants and Lawsuits in Northern New Mexico.

Ebright, Malcolm. Spanish and Mexican Land Grants.

Simmons, Marc. Hispanic Albuquerque, 1706-1846.

Lesson Plan: Land Grants

By Linda Spensley

New Mexico Standards:
Language Arts, Strand I: Students will apply strategies and skills to comprehend information that is read, heard, and viewed. Fourth grade 1, 3, 4.
Social Studies, II-B: Distinguish between natural and human characteristics of places and use this knowledge to define regions, their relationships with other regions, and patterns of change.

Objective: Students will gain a broad understanding of New Mexican land grants and the impact they have had on settlement of the Albuquerque area. They will learn about the difference in Hispanic and Anglo land tenure and will recreate conflicts between early Hispanics, Anglos, and the Native Americans who had lived on the lands. They will also learn about the history of the Atrisco Land Grant, which predated the founding of Albuquerque.

Grade: 4th

Class size: Up to 24

Duration: Flexible (Do reading activity in two sittings followed by class discussion or all the activities for a week)

Setting: Classroom

Materials:

- Copy of The Atrisco Land Grant
- Dictionaries (one per two students)

Background Knowledge:

1. Have students think about and write a definition of "land owner" or "ownership." Ask some students to read their definitions aloud. Have pairs of students look up the word "ownership" in the dictionary and read the definitions aloud.
2. Ask students if their family or members of their extended family own land or a business.

Activities: Choose one or two or use as a unit over a week or longer.

1. **Reading/Writing/History/Vocabulary**:
   a) The teacher reviews or students look up vocabulary words (a bit challenging, so omit words that are not appropriate for your particular students) before they read the article on land grants. (This list can also be used for a spelling list and assessment.)

b) Students partner read or choral read (since it is a bit challenging) the information on Albuquerque land grants and write a summary paragraph of what they read.

2. **Research:** Students research land grant information from the Internet, local libraries, and The Albuquerque Museum, to write a report. They can explore the founding, background, and historical-cultural nature of their area.

3. **History:** Are there land grants in your neighborhood? Find out through The Rio Grande Valley Public Library, The Albuquerque Museum, and the Internet.

4. **Art/History:** Research the flags and official seals of Spain.

5. **Field Trips:** The Albuquerque Museum, local community centers, walking tour of your neighborhood, early settlements (Las Golondrinas in Santa Fe), Casa SanYsrido (Corrales).

Assessments:

1. Students write a paragraph or more on what makes owning land or a home or business important to them.
2. Students take a spelling test on the lesson vocabulary words.
3. Students write a research report on the history, landmarks, and background of certain land grants.

Students answer comprehension questions after the reading sessions (Worksheet Included).

Resources:

www.cabq.gov/museum
www.golondrinas.org
www.ped.state.nm.us
www.nps.gov/pet/bookstore.htm
Google: type in “Atrisco Land Grant”

Vocabulary Words:

1. **FRONTIER**
2. **ISSUED**
3. **PATRONS**
4. **INDIVIDUAL**
5. **ALLOTMENT**
6. **AUTHORIZED**
7. **TERRITORY**
8. **SETTLEMENT**
9. **LABOR**
10. **IMPOSED**
11. **REOCCUPYING**
12. **FOUNDING**
13. **RELIANT**
14. **CULTIVATED**
15. **LEAGUE**
16. **INTACT**
17. **TREATY**
18. **PARCEL**

Vocabulary Words (With definitions loosely compiled and edited from *Scholastic Children's Dictionary, 2002.)*

1. **FRONTIER**: the far edge of a country, where few people live
2. **ISSUED**: given out
3. **PATRONS**: someone who gives money to or helps out a cause
4. **INDIVIDUAL**: a single and separate person
5. **ALLOTMENT**: an equal share or part
6. **AUTHORIZED**: given official permission for something to happen
7. **TERRITORY**: any large area of land under the control of a state, nation, or ruler
8. **SETTLEMENT**: a small village or group of houses
9. **LABOR**: hard work
10. **IMPOSED**: took advantage of someone or made unfair demands
11. **REOCCUPYING**: takes control of an area or country again
12. **FOUNDING**: setting up or starting something
13. **RELIANT**: dependant upon
14. **CULTIVATED**: crops were grown on land
15. **LEAGUE**: a measure of distance equal to about three miles
16. **INTACT**: not broken or harmed; complete
17. **TREATY**: an official agreement between two or more countries
18. **PARCEL**: piece of land

Land Grant Vocabulary

R F L E A G U E L L U L G T A
R H V D R N I N T A C T M J L
X V Y E T I E R E I T N O R F
D S P T I Y N U R W N A M N S
S E O A H P P D R T J R M S N
L E Z V R U T A I E O G O F U
I N T I O C E B T V L N C M X
S T F T R C E Q O R I I A G Q
S X Z L L O A L R F O D A N C
U T A U U E H B Y H T N U N V
E N A C B R M T U H R U S A T
D E S O P M I E U L E O H G L
U J T C Y E U B N A A F B C Y
C A L L O T M E N T T R K A M
R K G U F Q C V W N Y D Y T L

ALLOTMENT
AUTHORIZED
COMMOM
CULTIVATED
FOUNDING
FRONTIER
GRANT
IMPOSED
INDIVIDUAL
INTACT
ISSUED
LABOR
LAND
LEAGUE
PARCEL
PATRONS
RELIANT
REOCCUPYING
SETTLEMENT
TERRITORY
TREATY
VOCABULARY

Solution

Assessment

Write about the following ideas:

Tell about the history of land grants

Why did land grants change the way Albuquerque was settled?

How should land be owned?

Lesson Plan 2: Land Grants
Reading Session I

The Establishment of the Atrisco Land Grant

Land grants are large pieces of land given to individuals, groups and towns to promote development in the frontier lands. Land grants were awarded in Florida, Texas, Arizona and California, but the oldest land grants are in New Mexico. There were more than 150 community land grants totaling 9.3 million acres awarded by the Spanish and Mexican governments.

Native people did not "own" lands. They believed that the land belonged to their creator. It was not until the first land grants were made that the idea of land ownership was introduced to North America.

In New Mexico, land grants were issued for several reasons:

- To encourage settlement
- To reward patrons of the Spanish government
- To create a protected zone between Indian tribes and populated areas.

Spain also issued land grants to several native Indian Pueblo cultures that had occupied the areas long before Spanish settlers arrived. In the Albuquerque area the Pueblo de Sandia and the Pueblo de Isleta grants were awarded by the Spanish governor.

There were two types of Spanish and Mexican land grants made in New Mexico: community land grants and individual land grants. Originally, the king or the local governor could make both kinds of land grants. When Mexico won its independence from Spain, the Mexican government continued to make land grants.

Community land grants were typically organized around a central plaza, like Old Town. Each settler received an individual allotment for a household and a tract of land to farm, and common land was set aside as part of the grant for use by the entire community.

Sometimes important people asked for land grants. The Rio Grande and its surrounding valley were green with vegetation. Settlers considered this land ideal for settlement, agriculture and grazing.

Early History

During the Coronado Expedition of 1540, Captain Hernándo de Alvarado led the advance guard. He and his men were the first Europeans to see the Middle Rio Grande Valley, including the Valle de Atrisco.

Spanish history of the Valle de Atrisco begins in 1598 with the arrival of Don Juan de Oñate, who entered the northern frontier of Nuevo Mexico to claim the territory on behalf of the King of Spain. By the early 1600s a number of Spanish *estancias* (farms or ranches) dotted the area of the Rio Grande Valley between the Pueblo de Sandia on the north and the Pueblo de Isleta on the south.

Spanish settlement came to a halt in 1680 with the outbreak of the Pueblo Revolt. Pueblo people rebelled over forced labor and religion imposed on them by the Spanish colonists and missionaries. The Spaniards fled New Mexico.

Twelve years later, Don Diego de Vargas succeeded in reoccupying Nuevo Mexico. Within the ranks of De Vargas' volunteer army was a native New Mexican, Don Fernando Duran y Chavez II. In 1692, De Vargas awarded Don Fernando an 82,000-acre land grant on the lands where his father, Don Pedro, once lived. This land became known as the Atrisco Land Grant. In 1703, three years before the founding of La Villa de Alburquerque, the Town of Atrisco was founded and families moved into the area.

Settlers in the Atrisco valley built their *haciendas* (homes) along the Rio Grande. Here they grazed sheep and cattle on the lush grasses in the valley, and the livestock provided food, leather and wool for clothing. They cultivated and irrigated land to grow corn, chile, wheat, squash, alfalfa, and beans.

By 1760, more than 200 people had settled in Atrisco. The valley was becoming crowded, so in 1768 the Atrisco Land Grant expanded from the Rio Grande west to the Rio Puerco, which added much grassy land on mesa tops.

Surrounding the fields were common areas, owned by the community. Each community member was responsible for taking care of the common area and for cleaning the *acequia*, or irrigation ditch. The Spanish also enforced the Four Square League law; this required that the land surrounding a Native American pueblo be allotted to that pueblo for one league in each direction from the pueblo itself. No grant could cover his land. This set up boundaries for the Pueblo Indians and helped contribute to keeping their Pueblo cultures intact.

Other land grants in the Albuquerque area were the Alameda, Carnuel, Elena Gallegos, Pajarito and the Town of Alburquerqe Grant.

Reading Session II

Treaty of Guadalupe Hidalgo

For the most part, Spanish settlement occurred with little interference, until the English and French began to move west. After the establishment of a United States government, the United States steadily acquired more land and expanded south to Florida and west to California. Treaties with Spain and France and with many Indian tribes extended the U.S. boundaries westward. After Texas won its independence from Mexico, it became a state, but disputes remained over boundaries. The Mexican-American War broke out over the boundary between Texas and México. In 1846 U.S. troops claimed New Mexico.

In 1847, U.S. troops occupied Mexico City, and México surrendered. The war officially ended with the 1848 ratification of the Treaty of Peace, Friendship, Limits and Settlement, commonly known as the Treaty of Guadalupe Hidalgo.

The treaty brought many changes to New Mexico and the Southwest. Ideas about land ownership were very different in United States and Mexico.

New Mexico then had a small population, and most people lived in small farming communities. They didn't speak English, and they were not familiar with American laws and culture. Mexican law was more flexible and usually interpreted according to local custom and usage. Courts were not as important as they were in the United States.

The American system saw land in imaginary squares laid out on a piece of paper. Property was identified through measures that relied on physical features of a particular piece of land, such as a stream or hill. Americans measured land by sections. Each section was one square mile. The exact measurements of pieces of land were marked on a map. Land owners were usually individuals, not a community. And owners bought and sold their land as they wished and then recorded new owners with local government offices. This means that land could be bought and sold like a horse or a basket of fruit. It was a commodity.

The Mexican and Spanish systems were very different. Their ideas of land ownership began with community ownership patterns of medieval Europe. They saw land as part of the community, a resource to be used for everyone. So everyone used the land but no one person owned it. It was not a commodity. However some property could be sold to individuals after they had used the land for so many years.

The Mexican system of land ownership was referred to as *usufruct*, "use the fruits of the land, but do not own the land." Land boundaries were defined using visual landmarks (such as rivers or mountain peaks) or the adjoining property, but often any markers were hard to find. Records were not exact.

Differences between American and Mexican Systems of Land Ownership

American	Mexican
Defined by range, township, section numbers	Defined by landmarks
Viewed as a commodity to be purchased	"Use value" more important than land value
Fee simple – no restrictions on transferring ownership	Restrictions on who could own lands
Impersonal sales	Usually sold/given to family member or neighbor
Meticulous record keeping, recording of deeds	Few records, no deeds

For this reason, there have been conflicts over land grants. The U.S. government agents found that many boundaries could no longer be found. Some grants overlapped. Owners had lost their original papers. Ultimately government claims officials rejected many claims. They either divided common lands among heirs or turned them over to federal agencies like the U.S. Forest Service. Controversy over land ownership continues to this day.

Some land grants survived. New Mexico still has 22 land grants of 200,000 acres.

The Atrisco Land Grant today

Atrisco was able to prove its ownership of lands, but the heirs fought amongst themselves for many years. In 1967 the Atrisco Land Grant became Westland Development Company, Inc., which today manages approximately 56,000 acres of Atrisco's land holdings. For over 400 years the *Atrisqueños* (Atrisco Land Grantees) have seen many changes, from the Pueblo Revolt to New Mexico's independence from Spain, and New Mexico's statehood in 1912. Today, the Atrisco Land Grant is one of the oldest continuous existing land grants in the United States and one of the only Spanish Colonial grants still owned by heirs of the original settlers.

Activity

Group size: 15-25

Setting: Classroom

Materials:

- Atrisco Land Grant handout
- Name tags labeling Hispanics, Pueblo Indians, Navajos, and Anglos

Set up:
The idea of this game is for students to realize it is difficult to know who owns the land. Desks will become the "land" for which everyone is fighting. There should be six desks fewer than the number of students.
Photocopy the "Atrisco Land Grant"
Create name tags for each student. For 22 students and 16 desks you could have:

3 name tags for Pueblo Indians
3 name tags for Navajos
8 name tags for Hispanic settlers
8 name tags for Anglo settlers

Distribute the tags to students when they are assigned their titles.

Procedure:
The object of the game is to provide students with a chance to think about unresolvable conflict regarding land ownership. Students will reenact the conflict between Native Americans, Hispanics and Anglo Americans in their quest to settle New Mexico.

1. Choose three students to represent three Indian Pueblos and three to be nomadic Native Americans, such as the Navajos and Apaches. The three Pueblo Indians should choose one desk each to be their "home." The three Navajos should each choose one desk to be their temporary homes and must switch desks every ten minutes; they do not retain a permanent home. The Navajos should understand that this is their ancestral home; all the desks belong to them and the land is theirs. Although the Pueblo Indians know that this is their ancestral home, they are content, knowing they have their pueblos and surrounding lands.

2. Choose eight students to be Hispanic settlers. Divide them into two groups and give each group a land grant. Instruct the members of each group to choose a desk close together to be with their group. Hispanics should create boundaries for their grants by moving desks into clusters. They can form a circle around the Pueblo Indians and the Navajos, if they wish. Don't forget to keep the Navajos moving to different desks every ten minutes. By now, the Native Americans should feel the pressure of settlers moving to "their" land.

3. The rest of the class becomes Anglo settlers, who come to settle large amounts of land. However, there are eight Anglo settlers and only four parcels of land left. Here comes the conflict.

4. Have two Anglo settlers occupy the last two desks. Have three more Anglos pick three Hispanics and question them as to their ownership of the land. The Hispanics should remember they have a piece of paper that says they own the land, plus the memory of their neighbors proving they have had the land for a long time. Encourage them to argue their points; the Hispanics, with no recorded proof ownership, will have to go live with other Hispanic settlers. The teacher can play the role of lawyer. Have one of the remaining three Anglo settlers take one of the Navajos and remove him from his land. The Navajo must figure out where to go – maybe another Navajo will allow him to use his land.

5. The remaining two Anglo settlers should do the same. By now there is not enough land to support all the people. Have the last two settlers displace two more people, either Hispanic or Native American. Remind the Native Americans that this is their ancestral land, although they don't have a piece of paper that claims ownership they have always lived there.

6. Encourage students to use some of the following arguments and to think of others:

Pueblo Indians:

- *This is our land. This was given to us by the Creator.*
- *This land is sacred. We need our sacred sites. This is where our ancestors live.*
- *Our land goes from the river to the mountain top.*

Navajos:

- *We are hunter-gatherers. We need a large area of land for our yearly movement in search of plants and game.*
- *You took away our summer hunting grounds. Now, we are angry. We are going to raid your settlements.*
- *You Spanish people have taken our children to be your slaves. Now we will raid your farms and take from you.*

Hispanic Settlers:

- *This is our land. We have the grant giving the land to us by our Governor. We were here before the United States existed.*
- *We have built acequias (ditches for water) and cleared the land. We have been here for generations. You can't take it away from us.*
- *My neighbors can vouch for us; they know we have worked this land for years.*

Anglo Settlers:

- *You don't need this much land, but we do because we have cattle.*
- *It is our right to settle this land.*

- *You have land that no one owns. You can't prove you own anything – nothing is recorded.*
- *We need corridors for our cattle drives and room for or railroads.*
- *We will sell and trade with you Hispanics and Indians if you let us have this land.*
- *We will give you Indians a reservation to live on if you move off this land, and we will take care of you forever.*
- *We will pay you Hispanics some money for your land.*

7. After talking over the various conflicts, the instructor chooses a time when the Treaty of Guadalupe Hildago is signed. This is a pivot point. Now everyone is American. Have two of the Anglo settlers take another desk and claim it as their own, since they can have more than one piece of land. Have the ousted people go and live with others.

8. Remove the Navajos to a far corner of the room, with no desks. This is to be their "reservation." Have the American settlers occupy what was once Indian land.

9. Remind the Navajos occupying reservation land that there may be hidden values in their so-called "inferior" land. Discuss with them what they might find valuable on their land: timber, mineral resources, oil and gas etc. What would the Americans do if they found out there was value in reservation land? Do the same with the Pueblo Indians.

10. There is no ending to the game, just as there are still conflicts with existing land grants. As a follow up, have students research one of the dozen land grants in the Albuquerque area and report back to the class. (Sandia, Bernalillo, Angostura, Santa Ana, Las Huertas, Elena Gallegos, Alameda, Corrales, Carnuel, Alburquerque, Parajito, Atrisco, and Isleta)

Resources:

Cline, Howard Frances. Spanish and Mexican Land Grants in New Mexico, 1689-1848. New York: Clearwater, 1964.

Ebright, Malcolm. Land Grants and Lawsuits in Northern New Mexico. Albuquerque: University of New Mexico Press, 1964.

Ebright, Malcolm. Spanish and Mexican Land Grants. Manhattan: Sunflower University Press, 1989.

Cannons, Fire and Smoke
The Civil War in Albuquerque

For 36 days in 1862, Albuquerque became the Confederate capital of New Mexico. The town was also the scene of a half-hearted skirmish between Union and Confederate troops, following significant, bloody battles near Santa Fe and Socorro.

The Civil War opened in April 1861. A number of army officers serving in New Mexico at the time resigned their commissions to join the Confederate Army. They included Maj. James Longstreet, the quartermaster at Albuquerque; Col. William W. Loring, the ranking officer in the territory, and Col. Henry Hopkins Sibley, who had been stationed at Albuquerque and was then in command at Fort Union, New Mexico.

Maj. Edward R. S. Canby was left in charge. Promoted to colonel, he would lead the New Mexico forces in defending the territory. Sibley soon became a brigadier general, charged with annexing New Mexico for the Confederate States and gaining control of Colorado's gold mines.

Col. Canby was tall and clean shaven in a time when men favored whiskers. He stood very straight, which inspired confidence and respect among his men. He was a cautious, methodical man and a careful planner.

Gen. Sibley was his exact opposite. Sporting mutton-chop sideburns, a thick mustache and a curly chin beard, he looked the part of a general in his gray uniform with polished spurs and shining buttons while sitting erect on his horse. But he had trouble making decisions and often sought the advice of his junior officers. He had another weakness that would doom his New Mexico military campaign – he was too fond of rum and whiskey.

In September 1861 President Abraham Lincoln appointed Henry Connelly, of Peralta, as New Mexico's governor because he trusted Connelly to be loyal to the Union of the United States and because Connelly, who had lived here a long time, had the sympathy of native New Mexicans.

Just five days after his inauguration in Santa Fe, Gov. Connelly contacted each county in the territory urging the establishment of a militia, or home guard, for the defense of the territory against the enemy – Texans serving in the Confederate Army.

An overly confident Sibley in late January 1862 led an invasion force known as the Army of New Mexico, which consisted of three regiments of cavalry and a battery of artillery, from his headquarters in El Paso into the Territory of New Mexico. He had previously issued a proclamation to the people of New Mexico announcing his intention to take possession of the territory.

Canby anticipated just such an invasion and had tried to shore up his fighting forces with a volunteer infantry and cavalry paid and equipped by the U.S. government. Kit Carson commanded the First Regiment of New Mexico Volunteers, and Col. Miguel Pino and Lt. Col. Manuel Chaves commanded the second. Canby favored Hispanics in filling officers' ranks, believing it would attract more volunteers. Albuquerque became a rendezvous for recruits, who were sent south to Fort Craig, south of Socorro.

Texans had already seized Mesilla in southern New Mexico when Sibley pushed north along the Rio Grande. Sibley expected to meet Canby's forces at the federal stronghold at Fort Craig. Gov. Connelly had also arrived at Fort Craig. Canby assured the governor that he had 4,000 men, of whom 1,200 were regular army troops, and all were ready to fight.

The two sides met on a battleground outside the fort. In a hard-fought battle, known as the Battle of Valverde, the Union was holding the line. Then Col. Tom Green, standing in for Sibley who was drunk in his tent, ordered an all out charge straight at Union regulars. The ploy worked. Union soldiers broke and ran, which caused the volunteers, many of them poorly trained, to flee in panic. They took refuge in the fort. Sibley, not wanting to attack the fort, ordered his forces to continue their march north.

When Colonel Canby realized he was being bypassed, he became concerned for the military stores at the Albuquerque post. He sent his quartermaster, Maj. James Donaldson, to slip through the lines and warn the small forces in Albuquerque and Santa Fe to remove or destroy the supplies stored in both places.

The governor also slipped quietly out of Fort Craig and rode north. Concerned that Albuquerque was defenseless and would soon be taken by rebels, he advised ranchers and small farmers to gather their sheep and cattle and conceal them in the Manzano Mountains. The citizens of Albuquerque collected their valuables and took them out of town or buried them. Some Albuquerque families felt it was best to leave their homes and travel to Santa Fe. It was said around town that the Texans were *"mucho mas grande que los Americanos,"* or "a lot bigger than the Americans."

In Albuquerque Capt. Herbert M. Enos, the assistant quartermaster and ranking officer, moved as many supplies as possible from the military depot and destroyed the rest. Assigned to him were twelve regular soldiers and some local militiamen and volunteers led by Col. Francisco Perea.

On March 1 Enos sent six wagons to the Sandia Mountains to gather firewood. The wood cutters spotted the approaching enemy, and a rider galloped into the plaza with the news that the rebel army was only 20 miles away at Los Lunas. The captain quickly sent a rider to the wood-cutting soldiers in the mountains that they were to go east through Carnué Pass (Tijeras Canyon), to Galisteo and Santa Fe.

Back in Albuquerque Enos ordered some army wagons, already filled with arms and ammunition, to leave immediately for Santa Fe, guarded by a few regular soldiers. He also had the volunteer militia work past sunset loading the several remaining wagons with baggage, which he would lead north to Santa Fe. At dawn the lookout reported that the Confederate Army was south of town near what would become the South Valley neighborhood of Barelas. So at 6:30 a.m. on March 2, Enos ordered his men to burn the buildings that held military equipment, along with neighboring stables and corrals.

Watching from the shadows, some of the town's poor people scrambled into the burning buildings to carry away molasses, vinegar, soap, candles, a few saddles, carpenter's tools and even some office furniture, as Captain Enos led his caravan of loaded wagons out of town. The blazing fires and the choking smoke, along with the noise and excitement announced that the Civil War had come to Albuquerque.

The approaching Confederates saw three columns of smoke rising over the town with sinking spirits. They were cold and hungry, and their horses were thin from fast marching and short supplies of grass. They proceeded to occupy Albuquerque.

Within an hour of arriving, a rider from the small village of Cubero, west of Albuquerque, reported that four Confederate sympathizers led by Dr. F.E. Kavenaugh, a Cubero storekeeper, had demanded the immediate surrender of the supplies from a small Union outpost whose volunteer captain had no orders to follow. Four days later a badly needed supply wagon arrived.

When Sibley arrived after March 6, he moved into the adobe home of Rafael Armijo and his younger brother Manuel, which became his headquarters. The Armijo brothers, who were store owners, turned over $200,000 in goods. The Armijos weren't necessarily southern sympathizers. While most Albuquerque residents were Union partisans, many native New Mexicans were ambivalent about this war between states. New Mexico was not yet a state and had only been a territory of the United States for about 13 years. Seeing the easy capitulation of the Union in New Mexico, the Armijos aligned themselves with the side they expected to win. Their conclusion was premature.

The Confederates marched north, expecting to capture Fort Union. Unknown to them, Colorado volunteers, led by Maj. John Chivington , had hurried from Denver to shore up the thin Union forces in New Mexico and discourage an invasion of their state.

Lt. Col. Manuel Antonio Chaves, a seasoned member of New Mexico's militia, was asked to join the Confederates but chose to be loyal to the Union. He led a spy company into Santa Fe and informed Chivington of the rebel troop strength and their movement toward Glorieta Pass. On March 28 Chivington, reinforced by troops from Fort Union, engaged the Confederates in a hard battle. Sibley remained comfortably in Albuquerque.

In a flanking action the Union forces also slipped behind the Confederate lines, led by Manuel Chavez, and burned 61 wagons in Sibley's supply train. It was a decisive strategy. The Battle of Glorieta Pass was over. Without supplies the rebels had no hope of taking Fort Union.

Manuel Chaves is a little-known hero of the Battle of Glorieta Pass.

The Texas army retreated to Santa Fe and then to Albuquerque, where they commandeered Franz Huning's flour mill at what is now Laguna and Central. The mill was named, ironically, La Glorieta. On April 8, Canby, then at the small farming settlement of Barelas, south of what is now downtown, ordered four Union cannons to fire on Albuquerque. The colonel had decided to make a noisy "demonstration," as he called it – a show of strength by his small army. The cannons of the rebel army, located at the mill near present-day Old Town, returned fire.

The "Battle of Albuquerque" lasted several hours. It was only an artillery shelling, with no casualties. Maj. Thomas Duncan of the Union Army, struck in the head by a shell fragment, was the only one wounded. As the cannon balls flew back and forth, a worried group of citizens approached Canby and told him the Confederate Army would not allow the women and children who had remained in their homes to leave and find a safe refuge. Canby ordered his men to stop firing. The Battle of Albuquerque had ended.

As the sunset glowed red, orange and pink in the west, both citizens and Confederate soldiers watched the campfires of a thousand Union Army soldiers burn brightly as day turned into night. Worried residents wondered if the ceasefire would end the following morning and the battle would resume. They heard the Union Army musicians playing their instruments well into the night and saw the campfires slowly die out.

Unknown to citizens or Confederates, Canby thought a larger force of Sibley's forces would return to Albuquerque and had ordered his soldiers to quietly move south during the night leaving the musicians behind for part of the night to cover up the noise of their departure. Canby moved into the Sandias, where on April 1 the victorious Colorado volunteers joined him at the village of San Antonio. Canby now had a large force, which he soon sent towards Albuquerque.

Sibley had by then arrived in Albuquerque from Santa Fe. At a meeting of his officers, he explained their situation. They had food for 15 days and only 35 to 40 rounds of ammunition per man. To save his army he felt it was best to retreat down the valley and out of the territory. No one disagreed. Some of the wounded would have to be left behind.

Eight brass howitzer cannons, for which they had no ammunition, would also be left behind. In the middle of the night Capt. Trevanion T. Teel, chief artillery officer, was ordered to bury the howitzers in secret at a corral behind San Felipe Neri Church. Sibley wanted to be sure the cannons would not be used against the Confederacy in the future. They were later recovered, and two are preserved in The Albuquerque Museum.

On the morning of April 12, the rebel army began its retreat southwest of town, crossing to the opposite bank of the Rio Grande. Traveling with Sibley and the Confederate Army were the unhappy brothers, Rafael and Manuel Armijo, who had to leave behind their homes, their fortunes and their reputations.

Bringing up the rear was Col. Tom Green with the baggage train and the artillery. He didn't start until the morning of April 13, traveling on the east bank of the Rio Grande until he reached Peralta. A small skirmish between Union troops and the stragglers from Tom Green's group occurred the next day, but a cold, dusty and biting New Mexico spring wind ended the fighting. The following day Green's soldiers joined the rest of Sibley's army for a march southward out of New Mexico.

Resources:

Simmons, Marc. Albuquerque: A Narrative History

Simmons, Marc. The Little Lion of the Southwest: A Life of Manuel Antonio Chaves

Alberts, Don. Rebels on the Rio Grande.

Lesson Plan: The Civil War in Albuquerque

By Marilyn McGee

New Mexico Standards:
A. Content Standard: Social Studies, History. Students are able to identify important people and events in order to analyze significant pattern, relationships, themes, ideas, beliefs and turning points in New Mexico.
Benchmark: New Mexico. Describe how contemporary and historical people and events have influenced New Mexico communities and regions.
Performance Standard: Fourth Grade. Identify important issues, events and individuals from New Mexico prehistory to the present.

B. Content Standard: Language Arts, Expressive Writing. The student writes effectively for different audiences and purposes using appropriate writing strategies and conventions.
Benchmark: New Mexico. The student develops and uses writing strategies and conventions across content areas to describe, narrate, express, explain, persuade and analyze for a variety of purposes and audiences.
Performance Standard: Fourth Grade. Student composes fiction, nonfiction, poetry and drama using self-selected and/or assigned topics and forms.

Objective: The student will become aware that the Confederate Army occupied Albuquerque during the Civil War. The student will be able to articulate and record a timeline that shows the involvement of the Confederate Army during the Civil War in Albuquerque and New Mexico and shows the defense of New Mexico by the Union Army and the New Mexico Volunteers. The student will write a fictional paragraph or short story and create a diorama to illustrate this work.

Grade: 4th

Duration: Three class sessions; longer to create diorama

Setting: Classroom

Materials, Teacher:
- Copy of "Cannons, Fire and Smoke – The Civil War In Albuquerque"
- Copy of descriptive story, "The Battle of Albuquerque"
- Chalkboard or overhead Projector and tools
- Poster board

Materials, Students:
- Copy of "The Battle of Albuquerque," one for each student
- Writing paper and pencil
- Shoe box or tag board diorama form
- Colored construction paper
- Drawing Paper, crayons, colored markers
- Scissors, glue

Procedure:
1. The teacher will tell or read the story of "Cannons, Fire and Smoke – The Civil War in Albuquerque" to the class.

2. The teacher will lead a class discussion about what the students remember happening. The teacher will lead the class to develop the timeline of the events of the Civil War in New Mexico. The teacher will record the time line on the chalkboard or overhead or a chart. Because the time period is less than a year, the teacher may want to set the timeline up by the months involved so students can comprehend the short period of time when these events occurred. The teacher may want to discuss the concept of an interval in relationship to the units of time between each space on the timeline. Timelines are an excellent resource for students to construct a visual representation of events. This helps students see the spacing of events and the time frame within which they occurred.

3. Following the example the class has prepared together, each student will construct the student's own individual timeline using drawing paper, pencil, crayons, or markers. The students will include the following events:

- February 21, 1862: The Confederate Army defeats Union soldiers at the Battle of Valverde, and they advance north from Fort Craig.
- March 6, 1862: Sibley creates a Confederate headquarters in Albuquerque.
- March 28, 1862: Battle of Glorieta Pass
- April 8, 1862: "Battle of Albuquerque"
- April 12, 1862: Confederate forces withdraw from Albuquerque

4. The teacher will pass out the descriptive story, "The Battle of Albuquerque" and direct students to read the story silently. Then the teacher will have several students read the story aloud. Afterward, the class will form into teams of two and write a list of three to five events that happened during the "Battle of Albuquerque." At this time the teacher will lead a discussion in which students will list events they have written. A class list may be assembled on the chalkboard, overhead, or a poster board chart.

5. Following the oral rereading of the paragraph, "The Battle of Albuquerque," the teacher will assign the following activities:

a. Each student will write a fictional or imaginative paragraph or short story using one of the following ideas:

(1.) Write a paragraph, or short story about waking up the morning after the battle of Albuquerque. (Some possibilities: the soldiers are still fighting, another cannon is fired, a horse runs loose dragging a cannon onto the battle field, or a family tries to sneak out of Albuquerque in the early dawn.)

(2.) Write a paragraph, or short story about a family that has left Albuquerque several days before and has to return to find something valuable that was left behind. The family returns right during the "Battle of Albuquerque." In order to make this more interesting, the teacher can tell the following true story:

Encarnacion Romero was just a tiny girl when her wealthy parents loaded their offspring into carriages and joined other refugees streaming north. A short distance on the road, little Encarnacion remembered that she had left her doll behind. At her insistence, the family went back to retrieve it, lest it fall captive to the Texans. (Marc Simmons' "Albuquerque: A Narrative History," p. 178.

b. The students will individually, or in teams of two or three, illustrate their paragraphs or stories with a diorama, which they will assemble in a shoe box (turned on its side), or in a diorama form made of construction paper. (See directions.) If the students draw figures of the Confederate Soldiers and the Union Soldiers, they will have to research what their uniforms looked like. Also, if they draw cannons they will want to do an accurate reproduction. Students will also want to draw appropriate clothes, buggies and wagons that the people of Albuquerque used at that time. The Albuquerque Museum has some of these artifacts for examples. Marc Simmons' "Albuquerque: A Narrative History" has some excellent photographs in it.

(1.) A variation on the diorama could be for the students to draw one picture on drawing paper to illustrate their paragraphs or stories.

(2.) Another variation could be to create a large, 24 by 36 inch poster on poster board using a title (it might be the title of their story) and a large picture or illustration of something found in their story.

Extensions:

1. A field trip to the Albuquerque Museum, where students would view clothes, tools and other artifacts of this period. Scheduling a docent to conduct the visit would be a plus, as the docents can relay the history of this period. Also, visit Old Town Plaza where two replicas of the cannons are on display. The Albuquerque Museum conducts walking tours of the plaza so don't forget to schedule one for your class.

2. The class might want to undertake a class project where they create a replica of Old Town Plaza, making the buildings, roads and fences in 3-D. This could be created out of construction paper, boxes, cardboard, and poster board. It could be painted. It also could be constructed out of adobe (mud, straw and water).

Evaluation: The teacher will evaluate the individual students on quality, effort and enthusiasm for the completed projects. This lesson's main objective is to create an awareness of the Civil War, the fact that it happened in Albuquerque, and what life was like for the people of Albuquerque at that time.

VOCABULARY LIST: (To be reviewed before reading "The Battle of Albuquerque")

skirmish

Valverde

Glorieta Pass

Franz Huning

occupied

perimeter

Barelas

artillery

fragment

Resources:

Alberts, Don. Rebels on the Rio Grande.

Simmons, Marc. Albuquerque: A narrative History.

Simmons, Marc. The Little Lion of the Southwest: A Life of Manuel Antonio Chaves.

THE BATTLE OF ALBUQUERQUE

For 36 days in 1862, Albuquerque became the Confederate Capital of the Territory of New Mexico. The town was also the scene of a half-hearted skirmish between Union and Confederate troops. The "Battle of Albuquerque" followed two other very bloody battles in New Mexico, the first at Valverde near Socorro and the second near Santa Fe at Glorieta Pass.

The Confederate Army, retreating from the battle at Glorieta Pass, marched to Santa Fe and then to Albuquerque. They took over Franz Huning's flour mill south of his home, named La Glorieta, at what is now Laguna and Central. The Texans, or Confederate soldiers, occupied the courtyard, with their cannons set up around the mill. The mill was located on the outskirts of the village just southeast of what we now know as Old Town.

On April 1, 1862 Colonel Canby of the Union Army marched his soldiers slowly upriver following the five-week-old tracks of General Sibley and the Confederate Army. The Union Army arrived at the southern perimeter of Albuquerque in the area now known as the Barelas neighborhood. The colonel's scouts informed him that the main rebel army had not yet arrived from Santa Fe. The little villa seemed to be guarded by a small number of Confederate soldiers and their cannons. Colonel Canby had brought four pieces of artillery with him. The colonel decided to make a noisy "demonstration" with those four cannons. The cannons of the rebel army, located at the mill, returned fire.

The "Battle of Albuquerque," on April 8, lasted several hours. It was only an artillery shelling with no casualties. Major Thomas Duncan of the Union Army, struck in the head by a shell fragment, was the only one wounded. As the cannon balls flew back and forth, a worried group of citizens approached Colonel Canby and told him the Confederate Army would not allow the women and children who had remained in their homes to leave and find a safe refuge. The colonel ordered his men to stop firing.

As the sunset glowed red, orange and pink in the west, the citizens of Albuquerque and the Confederate soldiers watched the campfires of a thousand Union Army soldiers burn brightly as the day turned into night. Everyone wondered if the ceasefire would end the following morning and the battle would resume. They heard the Union Army musicians playing their instruments well into the night and saw the campfires slowly die out.

Unknown to the citizens or the Confederates, Colonel Canby had ordered his soldiers to quietly move south during the night, leaving the musicians behind for part of the night to cover up the noise of their departure. The "Battle of Albuquerque" was over.

Jubilation, Prosperity and Growth
The Coming of the Railroad

Early on the morning of April 22, 1880 excitement electrified the plaza. By late morning the square filled with railroad officials, dignitaries from other towns, the Ninth Cavalry Band from Santa Fe and the noisy members of the public.

After a thunderous roar from the artillery battery, a parade marched a mile east. People jammed the streets and sat on rooftops to watch. It was the biggest celebration Albuquerque had ever staged. The railroad had officially arrived.

The town's boosters had long sought the railroad. In the 1870s William McGuinness, editor of the Albuquerque Review, often wrote that Albuquerque needed the railroad to become a great commercial center. Surrounding the town were vast forests the timber industry might exploit if they had a way to ship lumber. Men had discovered gold and coal in the mountains. Ranchers raised sheep by the thousands throughout the valley. They all needed a railroad to transport large quantities of their products to markets.

The Seed

In 1859 Cyrus K. Holliday secured a charter for a railroad that would link Topeka, Kansas and Santa Fe, following the Santa Fe Trail. He named his railroad the Atchison and Topeka and then renamed it Atchison, Topeka and Santa Fe in 1863, which became known, simply, as the Santa Fe.

Because of the Civil War, Holliday had trouble raising money, but in 1868 the company built 360 miles of track from Topeka to the Colorado border. During the 1870s, the AT&SF struggled like every other railroad. They had all borrowed heavily, and passenger and freight traffic was still thin. The AT&SF survived by hauling cattle.

As the economy recovered, Holliday extended his tracks to southern Colorado and its coal fields. He then decided to build the line to Santa Fe. A second railroad, the Denver & Rio Grande Western Railroad, had the same idea, and the two raced toward Raton Pass. They arrived about the same time. The D&RGW crew went to bed. The Santa Fe crew worked all night. When the D&RGW crew appeared at 5 a.m., the heavily armed Santa Fe men held their ground. They traded threats but not gunfire, and the D&RGW crew withdrew.

The Santa Fe railroad continued south. In this time the Santa Fe Railway also took over the St. Louis & San Francisco Railroad and the Atlantic and Pacific Railroad. It needed approval from the Territorial Legislature to build into New Mexico. W.B. Strong, the Santa Fe's general manager, and Miguel A. Otero, who had many business interests in the East, went to Santa Fe and got a charter for the New Mexico & Southern Pacific Railroad Co., a subsidiary of the AT&SF.

Negotiations in New Mexico

New Mexicans assumed the railroad was a giant corporation with unlimited access to funds, but in fact the AT&SF was struggling to raise money from Eastern investors to continue building. In Las Vegas, the first major town in New Mexico, the railway wanted 30 free acres, $10,000 in cash and free right of way. When civic leaders declined, the railroad built its track a mile east of the town.

As the railroad approached Santa Fe, community leaders were sure it wouldn't bypass them, but Strong determined that the best route was through the Galisteo Basin, leaving Santa Fe 18 miles north of the track.

In Bernalillo railroad representatives asked landowner Francisco Perea and his nephew José Leandro Perea if they would sell land for shops and repair facilities and offered $2 or $3 an acre. The Pereas wanted $425 an acre and not a penny less. It wasn't greed motivating the Pereas, who were already quite wealthy. Francisco had run for Congress on a platform opposing the railroad because he feared it would ruin the wagon freighting industry.

Unable to consummate a sale in Bernalillo, chief surveyor Lewis Kingman, chief engineer Albert Alonzo Robinson (Robinson Park in downtown Albuquerque is named for his daughter), and three others boarded the Concord Stage Coach and traveled south to Albuquerque.

Wheels and Deals

Knowing what had happened in Las Vegas, Bernalillo and Santa Fe, local boosters were nervous but much better prepared and more than willing to accept what the railroad agents offered them. On July 5, 1879 merchant Ambrosio Armijo led a town meeting at the courthouse. All the influential citizens spoke about the benefits that would come to Albuquerque if it had rail service. They urged everyone to give AT&SF everything it wanted. They spoke of giving the company a free right of way through the village's eastern limits as a goodwill gesture.

The railroad men continued on to Albuquerque, where they quietly cut a deal with merchant Franz Huning, grocer Elias Stover and attorney William Hazeldine. The three formed The New Mexico Town Co., a real estate firm and a subsidiary of the New Mexico and Southern Pacific Railroad Co. The Town Company quietly bought up all the land in or near the right of way and deeded it to the railroad for one dollar and a share of profits from sale of lots.

That's why Albuquerque and not Bernalillo became a railroad boom town.

Tracking Progress

By the end of 1879 the tracks had progressed from Las Vegas to within 80 miles of Albuquerque. Construction engineers planned to build in a straight line south from Galisteo down the Rio Grande Valley. In early January 1880 railroad officials announced that the AT&SF would build the depot and rail yards about a mile east of the plaza, beside the road leading to Carnué Canyon (Tijeras Canyon).

That meant the tracks wouldn't run through Albuquerque. Instead, the tracks would be east of town to accommodate north-south track alignment and to avoid washouts when the Rio Grande flooded. The last rail was laid to the depot grounds by 4 p.m. on April 5, 1880. A boxcar pushed onto a side track became a temporary depot. On April 10, 1880, the tracks gained Albuquerque and on the 15th a freight train pulled in, without fanfare.

Albuquerque's Welcome

The official celebration, on April 22, began with a parade, led by the Ninth Cavalry Band from Santa Fe. A proud Franz Huning followed in his carriage, along with the carriages of other speakers and prominent citizens. Then came school children, horsemen with decorated bridles and saddles, and finally citizens in their Sunday best, either walking or riding their burros. They followed a road that Huning himself had improved from the plaza to the railroad tracks that would be called Railroad Avenue and, later, Central.

Arriving at the tracks, the crowd surrounded two flatcars pulled in as an impromptu stage, where speakers delivered flowery oratory in both Spanish and English. Huning was first to speak, praising the railroad and sharing his high expectations for the future development of Albuquerque. Other speakers included Miguel Otero, by then a vice president of AT&SF, and Hazeldine, who asked, "Are we of Albuquerque prepared to take advantage of this opportunity?" And the band played on.

Then the crowd climbed aboard a ten-car excursion train covered in red, white and blue banners for a free trip to Bernalillo. The 30-minute ride, traveling faster than most of its riders ever had before, was the experience of a lifetime for many, especially the poor people of Albuquerque.

In Bernalillo visitors were treated to another celebration with more speeches led, ironically, by José Leandro Perea and a fiesta with tables covered with food and drink. Back in Albuquerque revelers hurried back to the plaza for more festivities. Barrels of wine awaited them at the plaza. The military band played, artillery boomed and fireworks sparkled in the night sky. Father Donato Gasparri gave the final speech, pointing out that Albuquerque was the "heart and center" of the New Mexico Territory.

The sleepy little village of Albuquerque wasn't then the heart and center of the territory, but because of the railroad, in the decades to come, it would be.

Two Towns

The railroad spawned a second town, as stores and saloons sprouted along the tracks in tents and shacks. In time the new commercial district gained permanent structures of brick and brownstone. It became known as New Town, and the original community became Old Town.

The day after the grand celebration, Peter "Shorty" Parker established the first business in New Town, where the dirt road now named Railroad Avenue crossed the tracks. He paced off 6 square feet, which he claimed by squatter's rights. Next he dug a hole in the sand to keep his merchandise cool. With several broken boards and a barrel, he had a counter and opened his bar for business. Next the Concannon House opened for business in two spacious tents next to the tracks and south of Shorty's establishment.

Lots were selling for $10 each. Land speculators, opportunists, businessmen and professionals began arriving. A cluster of tents, shanties and even a few frame and adobe buildings began to rise along Railroad Avenue.

To link Old Town and New Town, the Street Railway Co. was organized in 1880. The trolley was the pride of Albuquerque. It had eight mule-drawn cars and three miles of track connecting the plaza with New Town and the suburb of Barelas. Its president was Oliver E. Cromwell, whose financial backers were Huning and Hazeldine. Passengers

could ride in the open cars from the railroad depot to the end of the line at Elias Stover's house near the plaza.

The light, narrow-gauge tracks ran down the center of Railroad Avenue on an elevated grade of dirt. Cars were so light that high winds often blew them off the tracks, which required riders and conductor to lift them back on again. There was a rush hour each morning and evening when workers commuted to and from the railroad yards, but the rest of the time the trolley operated at a slower pace. Drivers often waited for shoppers to finish their errands. Anyone who lacked a fare could charge it.

The founders of New Town hoped that New Town and Old Town would grow together and become one. But almost two miles of bare floodplain lay between. The tall buildings of New Town and the low adobe buildings of Old Town just didn't fit together, and neither did attitudes and cultures.

The two towns squabbled for years over the right to postmark their mail Albuquerque. From Washington, the post office decreed that they would use Old Albuquerque and New Albuquerque. Old Town wasn't formally incorporated into Albuquerque until 1949.

New Town Grows

The Town Company hired Col. Walter G. Marmon, a civil engineer, to survey, mark and name the new streets of the town site. Streets running north to south between the railroad and the edge of Old Town he named First through Sixteenth Streets. Because First Street faced the tracks nearly everyone called it Front Street. The cross streets running parallel to Railroad Avenue were named Copper, Gold, Silver, Lead, Coal, and Iron, apparently reflecting some optimism that Albuquerque would become a major shipping depot for the mining industry.

South of Coal the streets were named Huning, Hazeldine, and Stover. East of the tracks Marmon named a street Broadway because he thought any proper town ought to have a street by that name. The next streets were named Arno, for Franz Huning's son, and then Edith and Walter for his own children. High Street lay along gravelly hills that rose into the East Mesa. At this point the Town Company ordered him to stop, believing the town would never reach that far.

By 1881 a building boom was under way. Lyman Beecher Putney put up the first structure at First and Railroad Avenue to house his store. He had brought the building with him in panels, which he transported by flatcar. This type of building was called a "perhaps house" because it could easily be moved to another place. Putney lived in his store and slept in a hammock hung from the ceiling.

Mariano Armijo thought the town needed a good hotel, and he built The Armijo House, a three-story frame structure with a Mansard roof, on the southwest corner of Third and Railroad Avenue. Believing this eastern architecture would attract more guests, he departed from the familiar adobe buildings of the plaza. The A.A. Grant building, across the street from The Armijo House, was two stories tall, with space for four stores on the first floor and an opera house on the second floor. The Grant Opera House seated 1,000 people.

In 1882 a new hotel, the San Felipe, was built on the corner of Fifth and Gold for a cost of $103,000. It was a three-story brick building with a 40-foot tower, a fancy roof and 80 rooms.

Albuquerque also got a Harvey House. To feed passengers, the Santa Fe had struck a deal with Fred Harvey in 1876 to become sole provider of food services along the line. As the track moved west, Harvey opened Harvey House restaurants every 100 miles that became known for good food and service by the Harvey Girls, "women of fine character" who waited tables. Many a Harvey Girl survives to tell about her experiences in the famous establishment.

New Neighborhoods

Before long, land that was virtually worthless before the railroad began selling for $2,000 per lot. Huning, Stover and Hazeldine, Albuquerque's first land speculators, presumably did very well. Soon after the railroad arrived, Huning began building the Highland Addition, east of the railroad between Copper and Iron. Now called Huning Highland, it was Albuquerque's first residential development.

Huning was already a successful Albuquerque merchant, having opened his first store in 1857. Three years after the railroad's arrival, he built a 14-room mansion called Castle Huning at Railroad Avenue (Central) and Fifteenth Street. (It was torn down in 1955.)

The Pereas of Bernalillo may have missed an opportunity in not negotiating with the railroad, but they weren't out of the game. José L. Perea prospered in Albuquerque, building his own subdivision, now called the Downtown Neighborhood District, in 1881.

All of these men continued to be movers and shakers. Huning, Stover, Hazeldine and Perea, along with others, joined to organize the Territorial Fair, which became the State Fair. Stover was the first president of the University of New Mexico.

Albuquerque's Changing Face

The railroad brought goods in quantity that freighters had previously hauled on wagons and mule trains. It also brought newcomers. Before the railroad, Albuquerque's population was largely Hispanic with a sprinkling of Anglos. By 1885, the town counted more than 20 ethnic groups, including African-Americans, Chinese and Italians who were building the line.

The town's economy changed dramatically. Albuquerque became a shipping point for livestock and wool, and the lumber industry boomed. In the early 1900s American Lumber Co. was second only to the railroad as Albuquerque's largest employer. Its 110-acre complex was built between 1903 and 1905 near Twelfth Street. That's how the Sawmill Neighborhood got its name. At its peak it employed 850 men and produced milled lumber, doors and shingles.

The Alvarado

For some time the depot was a boxcar set on pilings. Construction began on the depot and railroad complex in 1901.

By then work had started on the Alvarado Hotel. Completed in 1902 at a cost of $200,000, it was considered the finest railroad hotel of its time. Charles F. Whittlesey designed the California Mission-style building, which featured towers, balconies, and arcades supported by arches. It had 75 rooms, parlors, a barbershop, a club, a reading room and a Harvey dining room. It also offered electricity and steam heat, luxuries at the time. Whittlesey's mark is on a number of railroad hotels, but he's probably best known for designing El Tovar at the Grand Canyon.

At the Indian Building, which stood between the hotel and depot, visitors could see Indian artisans at work and purchase their wares. It was a successful early effort to promote Indian art.

The Alvarado became the society center of the city, a place where families ate their Sunday dinner, if they could afford it. The Alvarado was an oasis in a city that still had dirt streets and little greenery. In its dining room the state's Constitution was signed in 1911.

Booms and Busts

In 1914 the railroad began building its Albuquerque shops south of New Town, along with the 75-stall roundhouse, the railroad's largest. For many years the railroad was the city's largest employer. In 1940 the Santa Fe Railway's roundhouse and shops had more than 1,700 workers. A steam whistle on the 240-foot smokestack blew at 7:30 a.m. to start the work day and again at noon for lunch. At 4 p.m. it signaled quitting time.

Albuquerque got air service in 1929 but it didn't affect the railroad for decades. That year Albuquerque was a stop on the first coast-to-coast transportation route using airplanes and trains. Airplanes then didn't fly at night, so Transcontinental Air Transport service paired with railroads. For the two-day trip from New York to Los Angeles, passengers flew during the day and traveled by train at night. TAT became TWA.

In the 1950s, the railroad began using diesel fuel instead of coal, and passengers began to do more driving. Air travel gained popularity. And there were more trucks hauling freight. The railroad started to decline. It closed its shops in the 1970s and, sadly, also tore down the Alvarado Hotel. The depot burned in 1993. However, 17 original buildings remain, and there are plans for the site, including a museum and a digital production studio.

After several mergers in the 1990s, the Santa Fe Railway became the Burlington Northern Santa Fe Corp., which operates more than 1,000 trains across a 33,500-mile rail system in 28 states.

The state plans a commuter rail system from Belen to Santa Fe, with the first link from Belen to Bernalillo to begin this year.

Resources:

Bryan, Howard. "The Second Albuquerque," ***New Mexico Magazine,*** April 1980.

Myrick, David. New Mexico's Railroads.

Poling-Kempes, Lesley. The Harvey Girls.

Simmons, Marc. Albuquerque, A Narrative History.

Lesson Plan: Coming of the Railroad

By Rhonda McGee

New Mexico Standard, Social Studies: History
Students are able to identify important people and events in order to analyze significant patterns, relationships, themes, ideas, beliefs and turning points in New Mexico.
Benchmark: Describe how contemporary and historical people and events have influenced New Mexico communities and regions.
Performance Standard, Fourth Grade: Identify important issues, events and individuals from New Mexico prehistory to the present.
Content Standard, Social Studies: Geography
Students understand how physical, natural and cultural processes influence where people live, the ways in which people live, and how societies interact with one another and their environments.
Benchmark: Understand the concept of location by using and constructing maps, globes and other geographic tools to identify and derive information about people, places and environments.
Performance Standard, Fourth Grade: Apply geographic tools of title, grid system, legends, symbols, scale and compass rose to construct and interpret maps.

Grade Level: 4

Duration: Discussion and lesson will take approximately 1 to 2 hours.

Setting: Discussion and lesson can take place in the classroom and/or library. Students will participate in class discussion, but will be divided into pairs for the lesson.

Materials:

- Books and information about the AT&SF Railroad and railroads in general. (It may be necessary for the teacher to make a "library" in his/her classroom.)
- Copy of the "Coming of the Railroad" background, one per pair of students
- Map of the Route of the Santa Fe Railroad
- Poster board
- Construction paper
- Art supplies
- Pencil

Objective: This lesson relates to Albuquerque's history by showing how the railroad had a great impact on our city's social, economic, and cultural growth.

Set Up: Before the lesson, students need to have a basic understanding of map symbols. They need to have seen a map showing the route of the Santa Fe Railroad, and they need to have a basic understanding of the railroad and its history.

Discussion Questions:
During the discussion of the history of the railroad, ask:

1. Name, and discuss, two reasons the AT&SF found Albuquerque so appealing for this new railroad.

2. How did the AT&SF survive during the Civil War? Why did they need to haul this type of cargo instead of passengers?

3. Why do you think the land around Albuquerque's railroad station was sold and developed first?

4. Pretend you were running the railroad. What two things would you have done differently in developing Albuquerque as a stop for the railroad?

Procedure:

1. Give each pair a map of the Santa Fe Railroad's route. Have a short class discussion on its contents. (What do you see?)

2. Do a shared reading of "Jubilation, Prosperity and Growth: The Coming of the Railroad." Divide this into several sections, read only parts of the information, or read over a period of several days.

3. Using the questions above, have a short class discussion on the history of the railroad in Albuquerque.

4. Divide your students into pairs, with each pair receiving the necessary supplies as listed above.

5. Using the supplies, draw a detailed map of the AT&SF railroad from Franklin, Missouri to Albuquerque, New Mexico. Using the map symbol for railroad, +++, lay your track.

6. Each map should have all of the stops along the railroad, any rivers, mountains and/or plains it would have crossed, and everything should be labeled with map symbols and names. The map should be colored neatly with markers, crayons and/or colored pencils.

Extension Activities:

1. After the students have completed their maps, have them write a detailed story on the laying of the track. Have them pretend that they were hired by Mr. Holliday to lay track from Franklin, Missouri to Albuquerque, New Mexico. What kind of things happened to them as they were laying track? What did they see?

2. Choose one of the stops along the railroad, like Raton, New Mexico, or Las Vegas, New Mexico, to do a brief history of the town. How did it get its name? When and why did the town begin? What impact did the

railroad have on the town? Is the railroad still having an impact on the town?

3. Give each student a picture of a locomotive engine that might have run in the late 1800s and/or the early 1900s. Have the kids, using clay and other art supplies, make a diorama of the engine. After they have made the engine, have them write a short history on the engine. How was it made? How did it work? What type of cargo would it have carried?

4. Take a field trip to the Albuquerque Museum. It has artwork and artifacts from the early railroad period to the present.

5. Information may be presented on the Santa Fe Trail in similar ways as on the railroad. A map may be drawn and labeled to show the route of the Santa Fe Trail, compared to the route of the AT&SF Railroad.

Resources:

Speaker:

John Messier (who loves to talk about railroads)
City of Albuquerque Planning Department
924 -3860

Nonfiction:

Balkwill, Richard. The Best Book of Trains. Kingfisher Publishing, New York. 1999.

Berry, Erick. When Wagon Trains Rolled to Santa Fe. Garrard Publishing, 1966.

Denver, John. All Aboard! (sound recording) Sony Wonder, 1997.

Lavender, David Sievert. The Santa Fe Trail. Holiday House, 1995.

Osterwald, Doris B. Ticket to Toltec: A Mile by Mile Guide for the Cumbres and Toltec Scenic Railroad. Western Guideways, 1992.

Place, Marian T. The First Book of the Santa Fe Trail. F. Watts, 1966.

Ross, David. The Encyclopedia of Trains and Locomotives: The Comprehensive Guide to Over Nine Hundred Steam, Diesel, and Electric Locomotives from 1825 to the Present Day. Thunder Bay Press, 2003.

Scarry, Huck. Aboard a Steam Locomotive: A Sketchbook. Prentice-Hall Books for Young Readers, 1987.

Walsh, Kieran. Travel Math. Rourke Publishing, 2004.

Young, Bill. The Great Railroads of North America**.** Dorsett Press, 1992.

Fiction:

Aylesworth, Jim. Country Crossing. Simon and Schuster Publishing, 1991.

Bunting, Eve. Train to Somewhere**.** Houghton Mifflin, 1996.

Finley, Mary Peace. Soaring Eagle. Marion Koogler McNay Art Museum Publishing, 1993.

Hagen, Jeff. Hiawatha Passing. Holt Publishing, 1995.

Macaulay, David. Black and White. Houghton Mifflin, 1990.

Stevenson, James. All Aboard! Farrar, Straus and Giroux. 1995.

Violette, Hallie Hall. On the Trail to Santa Fe. Houghton Mifflin, 1941.

Web sites:

www.sangres.com

www.nps.gov/safe/

www.atsf.railfun.net/

www.pbs.org/wgbh/amex/tcrr

Readin', 'Ritin', 'Rithmetic and Religion
The History of Education in Albuquerque

For more than a century the three Rs in Albuquerque also involved a fourth R, religion. Without the Catholic Church there would have been no formal education. After the railroad brought newcomers, Protestant churches also answered the need for education and training.

Early Education

Formal education in New Mexico began in 1599 with Franciscan priests who had entered with the Oñate expedition. Priests provided religious instruction and also taught Indian children to read and write until the Spaniards were expelled during the Pueblo Revolt of 1680. When the Spaniards returned after the reconquest in 1692, the priests educated both Indian and Spanish children.

In 1680 85 of 131 New Mexicans could not write their names, which means that 46 probably could. Those who were able to read and write likely made an effort to teach their children. If a woman was literate, the priest often noted that fact at the time of her marriage.

After Mexico won its independence, the Republic of Mexico introduced the first free public schools in New Mexico. These proved to be ineffective because the government didn't provide financial support. In 1828 the *alcalde* (mayor) of Albuquerque asked the governor for money for paper and books. Three years later the provincial assembly provided 40 pesos so Albuquerque's lone teacher could buy a few school supplies.

The school didn't enjoy support from parents either. They wanted their children at home so they could work. The village's wealthy residents were already sending their sons to the United States or Mexico for formal education.

When New Mexico became a U.S. Territory in 1846, the church was still educating a limited number of students and a few wealthy families sent their children to schools in St. Louis and farther east. The Sisters of Laureate operated a small school at San Felipe de Neri, but closed it in 1869.

Political instability, Indian conflicts and the Civil War prevented the territorial government from addressing education until 1872, when counties were empowered to spend public funds on education. That year the Jesuits opened a school for 60 boys in a house rented from merchant Ambrosio Armijo. Subsidized by money from the Territorial Legislature, the school continued through the 1870s, despite occasional challenges from Protestants.

After the Railroad

In 1881 the Sisters of Charity opened the Old Town Public School (for girls and boys) and Our Lady of Angels Private School in rooms of their newly built convent. Nuns taught the private school, and Jesuit priests taught the public school.

In this period Father Padilla began teaching classes for orphans whose parents had been killed by Indians. In the early 1890s his school became a public county school, Los Padillas, which then mushroomed into six rooms in 1912.

As New Town developed near the railroad tracks, the Armijo brothers (Perfecto, Mariano and Jesus) gave the church a tract of land to the north. There, St. Vincent Academy was established in a large, two-story building at what is now 6th and Lomas, and staffed by the Sisters of Charity. The Sisters also opened day schools in Barelas and Los Duranes. Sister Blandina Segale led the effort to establish and guide these early schools.

With the arrival of the Atchison, Topeka & Santa Fe Railroad in 1880, increasing numbers of Protestant families arrived in Albuquerque and took steps to establish schools for their children.

Colorado College started Albuquerque Academy (no relation to the existing school of the same name) in 1879 in Old Town as a Protestant boarding school. In 1882, it moved to a new building south of downtown on land donated by the New Mexico Town Co., the developer of New Albuquerque. The school received support from a national Congregationalist group called the New West Education Association, which helped create academies in territories without public schools. During the 1880s, the nondenominational Academy taught up to 300 students a year, both Anglo and Hispanic.

As Albuquerque Academy gained students, it needed a new building. Trustees raised $24,000 locally and nationally and in 1890 completed a three-story brick and stone building, complete with a clock and bell tower, at the corner of Edith and Railroad (Central) in Franz Huning's Highland Addition. Named Perkins Hall, it was hailed as the finest educational plant in the American Southwest. It opened with 337 students.

In this period the federal government often contracted with Protestant churches to educate Indian children. This is why, in 1881 the Presbyterians under Dr. Sheldon Jackson founded the United States Indian Training School in a rented adobe house in Los Duranes. In 1882 businessmen raised money to buy a 60-acre farm east of Duranes and donated it to the BIA. By 1882 the campus had buildings, and the school moved to its new campus. In 1886 the government took over management of the school.

That year the Presbyterians acquired 200 acres and started the Presbyterian Industrial School, a mission trade school for Indians. However, the government school was by then successfully educating Indian children, so the Presbyterian Home Mission Board decided to close the mission school.

The board reopened a boarding school it moved from Las Vegas. Intended to educate Hispanic students, this school was named Menaul Training School in honor of the Rev. James Menaul, who had long practiced in New Mexico. The school then became an elementary boarding school for Hispanic boys. By 1906 it included a high school. (The school became co-ed in 1934 and became independent of the church in 1972. It ceased being a boarding school in 2000 and now accepts applications from students of all backgrounds.)

Methodists started a school in 1887, called Albuquerque College, which closed after two years. Also in 1887, Emily Harwood, wife of a Methodist missionary, started a girls school in a small house downtown. Over the years it moved to larger and larger buildings until the Women's Home Missionary Society built a school at Seventh and

Mountain Road. (The Harwood Girls School closed in 1976. Today the building is the Harwood Art Center.)

At the end of 1890 the Albuquerque Daily Citizen observed: "Albuquerque is already recognized by the country at large as the railroad and commercial center of the Southwest, and the advance we have already made in the way of institutions of learning show that the town is to be recognized hereafter as also the educational center of the country… the location of the Territorial University at this point gives a nucleus around which to build in this direction, almost indefinitely…"

Public Schools

On February 12, 1891 the Territorial Legislature passed a new public education law, which allowed municipalities to establish local school boards with the power to sell bonds for school construction. The tax subsidies that had supported both St. Vincent and the Albuquerque Academy were now transferred to the Albuquerque Board of Education.

At its first meeting on April 14, 1891 the board created Albuquerque Public Schools. The Academy's principal, C.E. Hodgin, became the first APS superintendent. The Academy went out of business and leased Perkins Hall to APS, where the first classes began on September 7 with 350 students. By year end it had 660 students.

A $60,000 bond issue in 1883 provided for construction of four ward schools in the four sections of New Albuquerque. Still, supplies and textbooks were so scarce that Hodgin passed one set of readers from one school to the next.

In 1900, Central School was build at Third and Lead for junior and senior high school students.

Albuquerque got a public library in 1891 because women, led by the socially prominent Clara Fergusson and Emma Hazeldine, raised $1,000 by holding a ball, dances, plays, concerts, operas and garden parties. The Commercial Club (a forerunner of the Chamber of Commerce) provided space for the books.

By 1900 the library was too big an operation to continue as a charity. A year later the library opened in Perkins Hall, which Joshua Raynolds, president of the First National Bank of Albuquerque, had purchased and donated to the City of Albuquerque for use as a library. The building also continued to be used for overflow classrooms for the growing school system, and as a public meeting room.

Higher Education

The establishment of tax-supported, free public schools was part of a larger effort to achieve statehood for New Mexico Territory by convincing Congress that New Mexico was sufficiently advanced to function in the national economy. After H. B. Fergusson, Territorial Delegate to Congress, successfully argued that New Mexico lacked the resources to support education, Congress passed the Fergusson Act in 1898, which provided the territory with a bequest of four million acres of public lands. Revenues from these lands could be invested in education. This arrangement continues today; the State Land Office overseas public lands that generate revenues for schools.

The creation of institutions of higher education was another statehood-oriented development. Albuquerque attorney Bernard Rodey led an effort by New Town business leaders to create a state university. Other towns also wanted the university. At the 1889 Legislature, Rodey got a bill through that established the University of New Mexico in

Albuquerque; Socorro got a School of Mines and Las Cruces, the College of Agriculture. All would benefit from state land revenues through the Fergusson Act.

The newly appointed University of New Mexico Board of Regents appointed businessman Elias Stover as the first president.

Classes were held initially in Perkins Hall. Rodey also worked with community leaders to obtain a large site for the new university on the East Mesa, and construction began on Old Main, which opened in September 1892. This building, later called Hodgin Hall, housed everything until 1900.

In 1901 UNM's campus consisted of two red-brick, steep-roofed buildings sitting alone on East Mesa. That year William G. Tight became the third president of UNM and would subsequently embrace what became known as Pueblo Revival architecture. It became popular across the state, but it wasn't popular in the early 1900s and became a factor in his firing in 1909. For years, UNM built only small, forgettable buildings.

James F. Zimmerman, inaugurated in 1928, presided over UNM's first big growth spurt. In four years he increased enrollment from 400 to 1,000 and doubled the faculty. Embracing the Pueblo Revival architectural style, he built eight new structures – Carlisle Gym, Science Lecture Hall, Yatoka Dormitory, Parsons Hall, the president's home, Bandelier East Dining Hall, and Marron West Women's Dormitory.

Zimmerman wanted to do more. Before the Depression had tightened its grip, he got a bond passed to build new engineering labs, build a stadium and grade an athletic field. After that, UNM lacked funding and even suffered funding cuts. Faculty members took substantial reductions in pay. Zimmerman subsequently took advantage of federal relief programs to build facilities beneath the stadium in 1934. And he secured funding from the same source for a new administration building (Scholes Hall), to be designed by John Gaw Meem.

In addition, Zimmerman went after funding to support unemployed professional workers, research, art projects and students.

In 1935, with federal money, UNM began building a student union building (the present anthro building) and a new library (Zimmerman Library). By the end of the decade, more than $1.6 million in federal money had improved all aspects of campus life.

Legacy of John Milne

With the approach of statehood, APS in 1911 selected as its first superintendent John Milne, who had come here as a tuberculosis patient. He would serve until 1956 and is credited for establishing a modern, professional and progressive school system.

Anticipating the city's growth, Milne had the district buy large tracts of land for future schools. In 1911 APS gained national attention when Milne refused to segregate schools and said Spanish-speaking children had a language asset, not a handicap. He also emphasized science and mathematics instruction.

When Milne proposed a bond issue for the new Albuquerque High School in 1913, critics said the school was too big, that it would never reach its 500-student capacity. AHS was completed at Broadway and Central in 1914. (By 1927 AHS needed a second building. In 1950 the campus had five buildings.)

Between 1912 and 1919 voters approved more than $500,000 in bond issues. In the early 1920s the school district built Washington and Lincoln junior high schools and John Marshall Elementary School. It then built Longfellow and Eugene Field. In 1923 it

approved construction of University Heights Elementary School in the Terrace Addition, near present-day TVI. As a result of vigorous growth, the new school in 1927 was overcrowded, and portable buildings were necessary. Four years later APS built Monte Vista Elementary School on land donated by housing developers.

In 1927 public kindergarten began, and the flood of five-year-olds resulted in serious overcrowding, even with new schools. In this period, Milne determined that in order to meet projected growth of students, the district needed a "continuous building program."

Then the Depression took its toll. In 1931 schools began slashing budgets. Teachers suffered a pay cut, and kindergarten was eliminated, not to return for 40 years. When the vintage 1892 Fourth Ward School burned down, Milne got federal money to build Lew Wallace School. The same sources provided funding to hire unemployed kindergarten teachers and provide jobs to others improving the grounds. In 1934 Coronado Elementary was built to replace the old Third Ward school. In 1937 APS built Bandelier Elementary on land donated by developers. In 1940 the district completed Jefferson Junior High.

Without this infusion of federal money, it's unlikely that APS could have kept up with the district's growth. By 1939 Milne said APS had built nearly $1.2 million in new schools during the 1930s with less indebtedness than it had in 1929.

Albuquerque's postwar growth was extraordinary, but APS kept adding new schools. During Milne's tenure as superintendent, from 1911 to 1956, the system grew from 5 schools and 1,600 students to 63 schools with 40,000 students. Bernalillo County's schools were consolidated into APS in 1949.

APS in 1950 became one of the first in the country to operate its own radio station, KANW-FM. In 1958, in cooperation with the University of New Mexico, it began television broadcasting on KNME-TV.

Modern Schools

In the last 50 years, the schools have had to adjust to changing family structures and values, increasing language diversity and a variety of educational mandates from state and federal governments.

Parochial and private education also kept pace. Although St. Vincent's Academy closed, St. Pius High School opened in 1956 to provide Catholic education in the growing Northeast Heights. In 1988 it moved to the former campus of the University of Albuquerque on the West Mesa.

In the 1950s, the Simms family provided land and resources to create two prep schools -- Albuquerque Academy (originally for boys) and the Sandia School for Girls (now Sandia Prep). Both are now co-ed.

Albuquerque Indian School continued to educate students until 1980, when it was transferred to Santa Fe. The growing availability of public schools on or near reservations led to a declining need for government boarding schools. The buildings were razed in 1987.

In 1971 the Southwest Indian Polytechnic Institute was established to serve as a vocational post-secondary school for Indian students throughout the region. It has about 400 students.

In 1994, Rio Rancho schools separated from the Albuquerque system, but current APS enrollment is still more than 87,000 students in 130 schools, with more than 3,000 teachers and other employees. Charter schools were authorized in 1999, and APS now has more than 30 charter schools educating 6,000 students.

The district has worked to integrate new technologies into its curriculum, with computers and the Internet bringing radical changes to the traditional classroom-textbook method that served previous generations.

Two high schools offer high-tech academies. West Mesa High School has the Photonics Academy to educate students in optics and photonics from middle school through graduate degrees. It's the first of its kind in the nation. And Albuquerque High School has the Academy of Advanced Technology, a four-year program that creates career pathways in information technologies and also leads to TVI and UNM

UNM's Growth Matches City

The University of New Mexico's enrollment growth paralleled Albuquerque's postwar growth. President Thomas J. Popejoy, who was the longest serving president of UNM (1948 to 1968), led the development of UNM's schools of medicine, pharmacy, nursing, law and business.

Enrollment grew from 1,800 in 1946 to 26,500 students today. UNM has 145 bachelor's degree programs, 83 master's programs and 42 doctoral program. And it has branch campuses in four other communities. UNM has also gained a national reputation for research, particularly in medicine and high tech. Funded research in 2004 totaled $278.4 million.

The campus continued to utilize Pueblo revival-style architecture, enhanced by a 20-year relationship with noted architect John Gaw Meem.

Another college in the city that didn't survive was St. Joseph's College. It began in 1920 as a summer school for teachers and then became the Catholic Teachers' College in 1940. In 1949 the name was changed to St. Joseph's. It moved to the West Side on a site overlooking the river in 1950 and completed its campus a year later. In 1966 it became the University of Albuquerque. But the U of A couldn't compete with other educational choices and closed in the 1980s.

TVI Meets City Needs

Albuquerque Technical Vocational Institute began in response to the need for an increasingly skilled workforce. APS established TVI in 1965. Its first nine classes, for 155 students, were in surplus barracks and the vacated, 1923-vintage University Heights Elementary School.

TVI became independent in 1979 and has its own board. It has grown from its original campus at Coal and University to include the Montoya campus in the far Northeast Heights, added in 1979; a campus in the South Valley, in 1995; and a West Mesa campus in 2003. With 26,000 students, TVI is the second largest college in New Mexico and the nation's 55th largest community college.

TVI's regular curriculum includes arts and sciences, business occupations, health occupations, technologies, and trades and services. In addition TVI offers distance learning for both regular classes and customized classes for companies.

TVI has a long and well-deserved reputation for its responsiveness to employers' training needs. In 2004 the school added programs in microsystems, aerospace technology and film production to meet new demand in those areas.

Also in 2004 the National Science Foundation awarded a $2.8 million grant to TVI to establish the Southwest Center for Microsystems Education and the University of California chose TVI to develop a biophotonics technician program, the first of its kind in the nation, based on the excellent national reputation of TVI's Photonics Technology program. (Biophotonics is the use of light and radiant energy to understand living cells and tissue.)

Resources:

Biebel, Charles D. "Cultural Change on the Southwest Frontier: Albuquerque Schooling," New Mexico Historical Review, v. 55, # 3, July, 1980, p. 209-230.

Fitzpatick, George and Caplin, Harvey. Albuquerque – 100 Years in Pictures.

Garcia, Nasario. Albuquerque Feliz Cumpleaños! Three Centures to Remember.

Harrington, E.R. The Albuquerque Public Schools, 1963.

Hooker, Van Dorn. Only in New Mexico.

Hughes, Dorothy B., Pueblo on the Mesa.

Landon, Susan, "'Frontier Schoolmaster' Led APS for 45 Years." Albuquerque Journal, Sunday, September 19, 1982, Special Supplement, 100 Years of Progress., p. 77+.

Landon, Susan, "Schools Had Hard Soil to Grow in." Albuquerque Journal, Sunday, September 19, 1982, Special Supplement, 100 Years of Progress., p. 82.

Report of the Superintendent of Public Instruction of the Territory of New Mexico, in Report of the Governor of New Mexico to the Secretary of the Interior, 1899, Washington, Government Printing Office, 1899, p. 71-77.

Segale, Blandina, At the End of the Santa Fe Trail.

Simmons, Marc, Albuquerque, A Narrative History.

Wiley, Tom. Politics and Purse Strings.

Lesson Plan: Education History

New Mexico Standards
Content Standard, Social Studies: History
Students are able to identify important people and events in order to analyze significant patterns, relationships, themes, ideas, beliefs and turning points in New Mexico.
Benchmark: Describe how contemporary and historical people and events have influenced New Mexico communities and regions.
Performance Standard, Fourth Grade: Identify important issues, events and individuals from New Mexico prehistory to the present.
Content Standard, Language Arts: Expressive Language: Writing
The student writes effectively for different audiences and purposes using appropriate writing strategies and conventions.
Benchmark: The student develops and uses writing strategies and conventions across content areas to describe, narrate, express, explain, persuade and analyze for a variety of purposes and audiences.
Performance Standard**,** Fourth Grade: Student composes fiction, nonfiction, poetry and drama using self-selected and/or assigned topics and forms.
Content Standard, Mathematics: Geometry, Spatial Sense and Measurement
The student demonstrates an understanding of concepts, properties and relationships of geometry and measurement through experiences with meaningful mathematical problems that focus on identifying, describing, classifying, visualizing, comparing, estimating and measuring various aspects of shapes and objects.
Benchmark: The student explores and uses two- and three-dimensional shapes and understands their locations and transformations in the spatial plane. The student identifies, transforms and builds shapes. The student uses measurement systems, chooses the appropriate unit to measure, and begins to use formulas to solve measurement problems.
Performance Standard, Fourth Grade: The student will describe and construct examples of three-dimensional objects when looking at two-dimensional drawings.

Grade Level: 4

Duration: About 3 to 5 hours

Setting: Classroom.

Materials:
- Copy of the "Readin', Writin', Rithmetic and Religion" history
- Copy of the picture of Longfellow Elementary School (1893)
- Craft sticks and/or another building material
- Glue
- Scissors
- Markers
- Rulers

Discussion questions:

1. Why did the two educational laws in the late 1880s have such an impact on the starting of public education in Albuquerque?

2. What do you think might have happened if these laws were not passed?

3. Why do you think starting a school system was so important for Albuquerque?

4. Describe three things John Milne did that had a huge impact on our public schools then and now.

5. Name and discuss three things that are similar between our schools and the schools in the 1880s.

6. Name and discuss three things that are different between our schools and the schools in the 1880s.

7. Pretend you are the superintendent for Albuquerque Public Schools for this next school year. What changes would you make? What things would you keep the same?

Procedure:

1. Divide your students into groups of three to five.

2. Give each group a copy of the picture of Longfellow Elementary School. (Make sure the caption is blacked out under the picture.) Have a class discussion on what the building could have been, where it was built and when it was built.

3. After your discussion, tell the kids that this is a picture of Longfellow Elementary School, located on Edith Street in 1893. How does this 1893 school look different compared to present-day elementary schools?

4. Now, as a shared reading, read an excerpt from "Readin', Writin', 'Rithmetic and Religion." After the shared reading, have a class discussion on the article.

5. Hand out supplies to each group. Using the picture as a guide, the groups are to build a three-dimensional replica of the 1893 Longfellow Elementary School.

6. After the groups have built the three-dimensional replica, have the groups write a fictional story about the school. The setting is Longfellow Elementary School in the year 1893. Who were the teachers? How many students did it have? What grades were taught? What did they learn? How did they learn? What supplies did they have?

Extension Activities:

1. Once the buildings and the stories are complete, have the groups share their schools and stories. The stories can be shared by reading aloud or acting out.

2. Have each student do a research project on either John Milne or Charles Hodgin.

3. With a ruler, have the students calculate the perimeter and the area of their school. After they have calculated this information for their replica, have the groups estimate the perimeter and/or area of the real Longfellow School.

4. Using the same groups, have the students pretend that it is 30 years later and that they are now the superintendents of Albuquerque Public Schools. They are to design and diagram a futuristic elementary school. They are to design the inside and the outside of the school labeling each section carefully.

Resources:

See education background.

"Lungers" and "Sans"
The Legacy of Tuberculosis in Albuquerque

Tuberculosis. Isn't that a disease in third-world countries? Yes, but for decades until the 1940s, TB was a deadly disease afflicting the United States.

For Albuquerque, TB was more an opportunity than a curse. The town experienced a boom from health seekers, and the response to their needs birthed the city's modern health-care complex.

In the late 1800s, doctors and the public believed that sunshine, dry air, high altitude and warm climate would help tuberculars recover. In the early 1890s Albuquerque's Commercial Club, a forerunner of the chamber of commerce, began to promote Albuquerque to easterners suffering from tuberculosis, also called "consumption" and "the white plague." By 1909 TB had become the nation's leading cause of death.

Tuberculosis devastated lives. Nobody knew what caused it, when or whom it would attack, or how to cure it. This disease took children and adults. It struck rich and poor alike. Doctors didn't know what to do. Some of the more dubious treatments included collapsing a patient's lungs so they could heal; prescribing deadly does of creosote and opiates, which were available over the counter; and using X-rays.

Some doctors sent their patients west. Rest, good food, sunshine and a high, dry climate seemed to help. Others were drawn by the promotional advertising of Albuquerque's boosters and the railroad. Health seekers "chasing the cure" began arriving in Albuquerque in great numbers.

Care in Early Albuquerque

In those days the town had banks, hotels, stores, theaters, and mansions. What Albuquerque didn't have was hospitals. Although a few physicians and pharmacists had appeared with the arrival of the railroad, medical facilities were still in short supply. Health seekers lived in hotels, boarding houses, homes, tents and on the streets. Sick people, some arriving on stretchers and many without money, soon taxed Albuquerque's charities. Town boosters then changed their promotions to attract only health seekers of means.

For a long time citizens didn't understand that TB was communicable. The sick mingled freely with the well, and wealthy patients hired locals to work for them. As a result, the disease spread into the local population, with tragic results.

Seeing a need for better facilities, churches established facilities. The first was St. Joseph Sanitorium, opened by the Sisters of Charity in 1902. (A facility for the treatment of tuberculosis and diseases of long duration was called a sanitorium rather than a hospital.) The new sanatorium was in the "highlands" east of downtown; many Albuquerque residents thought it was too far out of town. The $50,000, three-story building had 38 patient rooms and sun porches, especially valued for treating TB.

The Sisters' mission was to treat the poor and underserved, and they were particularly concerned about TB patients. It was the city's first hospital to serve the community. By July 1904, the sanitorium had admitted more than 1,100 patients, almost a quarter of them charity cases. In the next few years the sanitorium would add a surgical wing, laundry, power plant, nurses' dormitory and 17 patient cottages.

In 1903 Rev. Hugh A. Cooper, a Presbyterian minister, came to Albuquerque to improve his health and became pastor of the First Presbyterian Church. Concerned with the large number of TB patients in the city, many destitute and dying, he decided that Presbyterians should lend a hand. In 1908 he founded the Southwestern Presbyterian Sanitorium, with support from the Commercial Club. The facility was a five-room house on Oak Street, one of the few homes on the dirt road to the university. It was the city's second sanitorium. Patients paid $40 a month for care, room and board. Presbyterian also added buildings. And it raised its own cows and grew its own food on land across the street.

Soon the town had eight sanitoria, mostly clustered between downtown and the university. There were also convalescent homes. The less fortunate stayed in tent houses, largely grouped around Presbyterian. As facilities increased, they drew pulmonary specialists as well as quacks. One treatment was "heliography," or sitting in the sun.

The Episcopal Church started St. John's Sanitorium in 1912. The same year the Methodist Sanitorium opened on Railroad (now Central) Ave.

Lasting Impact

The East Mesa drew such a concentration of "sans" and TB cottages that for a time the street was dubbed "TB Avenue," "Lunger's Row" or "San Alley." By 1912, nearly half the population was either a patient or family member. It wasn't unusual to see "lungers," as they were called, in bathrobes walking down city streets or making visits.

These patients provided a significant economic boost to Albuquerque. Medical suppliers, grocery stores, laundry services, pharmacies, and doctors' offices proliferated. And, of course, funeral homes.

More importantly, many recovered lungers stayed, becoming some of the city's most important leaders and outstanding citizens. They included Carrie Wooster, whose then suitor Clyde Tingley, would become the city's flamboyant mayor and New Mexico governor; John Milne, who was APS school superintendent for 45 years; Clinton Anderson, who was a notable U.S. Senator and member of Truman's cabinet; France Scholes, vice president of UNM; Grace Thompson Edmister, who founded and conducted the Albuquerque Civic Symphony; architect John Gaw Meem; and Kathryn Kennedy O'Connor, who started Albuquerque Little Theater.

Two recovering tuberculars would have a major impact on health care in Albuquerque. Dr. William Lovelace started his Albuquerque practice in 1916. Lovelace was intrigued with the Mayo Clinic and the concept of a multi-specialty clinic. In 1922 Edgar Lassetter, another doctor with tuberculosis, joined his practice, and they saw patients in a small office over a dry goods store on Central Ave. That year they founded Lovelace Clinic, which would grow into a multi-specialty practice based on the Mayo model. By 1940 they had 16 specialists.

TB facilities were still busy before World War II. Southwest Presbyterian Sanitorium had expanded to include a large complex of buildings and continued to draw

patients from around the country and even from Europe and Asia. The U.S. Indian Service built the Indian Sanitorium in 1934 for $500,000 and provided free treatment to Indian TB patients. In 1931 the Lutheran Church took over the operation of the privately operated Albuquerque Sanitorium, which had started in 1908.

Modern Health Care

The Sisters of Charity continued operating St. Joseph Sanitorium, but by 1927, Albuquerque's population had reached 36,000, and the Sisters began building a new hospital to accommodate the growth. The $500,000 facility opened in 1930 with 152 beds, three operating rooms and dining rooms.

When new antibiotics reduced the threat of tuberculosis in the 1940s, some of Albuquerque's sanitoria evolved as modern health-care facilities; others closed their doors.

In 1954 the Sisters of Charity closed St. Joseph Sanitorium, and it became a convent. By the 1960s Albuquerque's population had reached 350,000, and the Sisters decided it was time for a new hospital. They broke ground in 1966 for St. Joseph Medical Center and demolished the former sanitorium to make room. The new, 12-story, $10.8 million facility opened in 1968. It would continue to add facilities and become St. Joseph Healthcare System.

Lovelace Clinic also continued to grow. In 1946 William Lovelace's nephew Randy Lovelace joined his uncle, and they organized the nonprofit Lovelace Foundation for Medical Education and Research. The clinic built a new facility in 1949 on the Southeast Mesa, and Randy Lovelace persuaded the Methodist Church to build Bataan Memorial Methodist Hospital next door in 1952.

In 1975 the clinic and hospital merged with Lovelace Medical Foundation and evolved as Lovelace Health Systems. In 1991 the medical center and health plan were sold to a private health-care provider, and the foundation spun off as The Lovelace Respiratory Research Institute as a nonprofit. Today the institute continues the legacy of health-care research focused on the lungs, which began in the last century.

In 2002 Ardent Health Services acquired St. Joseph Healthcare System on its 100th anniversary and a year later acquired Lovelace Health Systems. Ardent joined the two to become Lovelace Sandia Health System.

In the early 1950s, Southwestern Presbyterian Sanatorium's board decided to hire a new administrator and change the focus and the name. It became Presbyterian Hospital Center. In 1960 Presbyterian Hospital expanded, and the early complex was largely demolished. Through the 1970s the hospital continued to grow, adding other facilities. Today Presbyterian Healthcare Services continues to be a not-for-profit corporation with facilities and services across the state.

Resources:

Simmons, Marc. Albuquerque: A Narrative History.

Lesson Plan: Tuberculosis

The Nation's Curse and Albuquerque's Windfall

By Lynn Taylor

New Mexico Standards, Social Studies:
Standard 5: Students will know and understand relationships and patterns in history in order to understand the past and present and to prepare for the future.
Standard 10: Students will know and understand the impact of economic systems and institutions on individuals, families, businesses, communities, and governments.

Objective: The children will become aware of the affect the dreaded, contagious disease, tuberculosis, had on the growth of Albuquerque.

Grade: 4th

Duration: 1 week

Setting: Classroom, UNM Hospital

Materials:

- Pencils, colored markers
- White art paper
- Microscope
- Computer

Background

(See accompanying report, "The Legacy of Tuberculosis in Albuquerque.")

In 1909, tuberculosis was the chief cause of death in the United States. Who would have thought that this deadly, contagious disease could enhance and increase the population of a city! Medical research in Albuquerque has its roots in the allure of the state for tuberculosis sufferers. The high altitude and dry climate attracted TB sufferers. Doctors who were interested in public health and infectious diseases, in turn, flocked to the state to treat these patients. This influx of tuberculosis sufferers helped shape Albuquerque into a center for medical research.

Albuquerque quickly became known as "The Heart of the Health Country." By 1912, 50 percent of the 13,000 people living in Albuquerque were here because they were either a TB patient or a family member of a patient. The first sanatorium in Albuquerque was St. Joseph, built in 1902.

Activities:

1. Write a short essay that describes the link between TB and other diseases (for example, hantavirus, emphysema, lung cancer, or other diseases that affect the lungs).

2. Draw the respiratory system showing a lung infected with TB. Describe how TB affects the system.

3. Write a short essay describing the tuberculosis industry and its impact on Albuquerque and New Mexico.

4. What is a sanatorium? How does a sanitorium differ from a hospital? Draw and label a map of Albuquerque in the early 1900s showing where the following eight facilities were located: original St. Joseph, new St. Joseph, Presbyterian Sanitorium, Albuquerque Sanitorium, Methodist Deaconess, Monk Bridge Manor, Miramontes, Memorial Hospital.

5. Write an essay that compares and contrasts treatments for tuberculosis in 1912 with those of today.

6. Observe a tuberculosis bacillus under a microscope or find an accurate picture of a bacillus online or in a medical journal. Draw and describe it.

7. Write a short biographical essay about a well known New Mexico resident who came to New Mexico as a result of TB. Here are some examples:
Clinton P. Anderson, Congressman and Senator
Don L. Dickason, lawyer
Katheryn Kennedy O'Conner, founder of Albuquerque Little Theater
George Fitzpatrick, magazine editor
William Randolph Lovelace, MD, co-founder of Lovelace Clinic
Edgar Lasseter, MD, co-founder of Lovelace Clinic
John Gaw Meem, UNM architect
Carrie Tingley, wife of Gov. Clyde Tingley

Extensions:

1. Call or visit the state epidemiological lab and ask about TB treatments today.
New Mexico Department of Health
1190 South Saint Francis Drive
Santa Fe, NM 87502
505-827-2619

2. Research the principal causes of illness and death nationally in New Mexico in 1900, 1925, 1950, 1975 and 2000. Graph the results and make an oral presentation to the class that describes the results and the reasons why the trends are as they are.

3. Using a skit or dramatization between a doctor and a patient, demonstrate the diagnosis of tuberculosis with an emphasis on the principal symptoms.

Resources

Web sites:

www.topix.net/health/tuberculosis

www.emedicine.com

www.photos1.blogger.com

www.pulmonologychannel.com

http://epi.health.state.nm.us/

Google – Tuberculosis photos

Books

Simmons, Marc. Albuquerque, a Narrative History.

Garrett, Laurie. The Coming Plague, Newly Emerging Diseases in a World Out of Balance

Vocabulary

a. lunger

b. healing breezes

c. consumption

d. bacillus

e. respiration

f. sanatorium

g. contagious

h. epidemic

Definitions:

a. person with tuberculosis

b. the thin, dry air of New Mexico

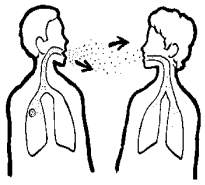
c. another name for TB

d. any of several rod-shaped bacteria that produce spores

e. the act of breathing

f. a special hospital for TB patients only

g. capable of being transmitted from one person to another, catching



h. affecting a large number of people in one area at the same time

Famous Albuquerqueans
Place Names in Albuquerque

Who was Alvarado? Who was Eubank?

One way we remember our finest citizens, our highest achievers, our greatest spirits is to name something after them. We may see names on buildings, parks or streets and wonder who they were. If you attended an event at Milne stadium, did you ever wonder who Milne was? Or who Tingley was?

Let's go for a ride around Albuquerque and think about names that have become familiar.

Who's Who in Old Albuquerque

The first Europeans to see the Middle Rio Grande Valley were soldiers led by Captain **Hernándo de Alvarado**. They were the advance guard for the explorer Francisco Vázquez de Coronado. Alvarado named the mountains he saw the Sierra Nevada and the river the Nuestra Señora. Those names didn't last, but Alvarado's did. Because Alvarado is our version of Columbus, his name is on many things, including the city's transportation center and an elementary school. The Alvarado was also the name of a fabulous, historic hotel next to the railroad tracks; the Santa Fe Railway tore it down in 1970.

The **Candelaria** family was one of the first to settle in Albuquerque in 1706. The major arterial, Candelaria Road, is named for them. On the other hand, nobody seems to know who **Juan Tabo** was. According to one account, he was a shepherd who grazed his flock in Tijeras Canyon. The name may also relate to the Toboso Indians of Texas or to Jemez Pueblo.

Another early settler was **Juan Griego**, or John the Greek, who accompanied Don Juan de Oñate's party of colonists to New Mexico in 1598. (The Spanish word for "Greek" is "Griego.") His descendents settled in the North Valley, and the community Los Griegos was named for them, as was Griegos Road.

In 1712 the governor gave 70,000 acres to Captain Diego Montoya, who then gave it to **Elena Gallegos**, widow of Santiago Gurule. (In colonial New Mexico women often took back their maiden names when they were widowed.) Unlike other European nations, Spain allowed women to own land without consent or control of their husbands. The Elena Gallegos Land grant stretched from the river to the base of the Sandias, where today a recreation area bears her name.

Elfego Baca, a Socorro candidate for sheriff who survived a one-man stand against dozens of Texas cowboys in 1884, became a lawyer and district attorney. In 1907 he moved his law practice to Albuquerque and had his combined office and home on

Gold St., where he died in 1945. Even as an old man, he always wore a gun. Walt Disney Studios created "The Nine Lives of Elfego Baca," which showed from 1958 to 1960. And he has a street in the Atrisco neighborhood named for him.

Dr. **Elijio Osuna** and his wife came here in the 1890s from Monterey, Mexico. He not only delivered many babies, he was also a coroner. His oldest daughter, Anita Osuna y Martínez de Carr, was the first Hispanic woman on the UNM faculty. In 1945 Osuna Road was named for the good physician.

When the railroad entered New Mexico in the 1870s, town boosters understood that it would change Albuquerque's fortunes forever if it could be routed our way. Merchant **Franz Huning**, grocer **Elias Stover** and attorney **William Hazeldine** formed a real estate firm that quietly bought up all the land in or near the right of way and deeded it to the railroad for one dollar and a share of profits from sale of lots. They prospered in the deal, but they also guaranteed the railroad would come to Albuquerque in a period after the railroad had bypassed Santa Fe and Bernalillo.

Soon after, Huning began building Albuquerque's first suburbs, the Highland Addition, east of the tracks, which came to be called Huning Highland. The streets south of Coal and Iron were Hazeldine and Stover. Arno, west of Broadway, is named for Huning's son. Nearby, Cromwell is named for **Oliver Cromwell**, a business associate of the three who started a trolley system.

Edmund G. Ross in 1869 was the U.S. senator who cast the deciding vote in Congress against impeachment of President Andrew Johnson. Ross resisted enormous pressure to impeach Johnson because he believed it would cause permanent damage to American government. But voting his conscience was political suicide. He came to Albuquerque in 1882 to escape but soon was dabbling in politics and in 1885 was appointed territorial governor. He signed the legislation creating UNM. An elementary school is named for him.

In 1889, as a member of the Territorial Senate, attorney **Bernard S. Rodey** was the driving force behind legislation to create the University of New Mexico and was also instrumental in securing its land. He was also a leader in the push for statehood and represented New Mexico in Congress. Rodey Theatre at UNM is named for him.

Naming Names in the 1900s

John Milne served as the Superintendent of Albuquerque Public Schools from 1911 to 1956 and is credited for establishing a modern, professional and progressive school system. Under his guidance APS grew from 5 schools and 1,600 students to 63 schools with 40,000 students. He purchased hundreds of acres of land when no one thought Albuquerque would ever stretch to the Sandia Mountains or west of the river. The district's first football and track stadium, Milne Stadium, is named for him. (Wilson Stadium is named for F.M. Wilson, a long-time educator and principal.)

Clyde Tingley came here in 1911, accompanying his sweetheart Carrie Wooster and her mother. Carrie had tuberculosis and they were looking for a city with a warm, dry climate. Tingley ran for City Commission in 1916 and thrived in local politics. He was commission chairman (the de facto mayor) three times and governor of New Mexico from 1935 to 1938.

During the Depression, the flamboyant Tingley cultivated a friendship with President Franklin Delano Roosevelt and proved extremely resourceful in getting Works Progress Administration and other relief funding into the state. In this way the first airport terminal, the State Fairgrounds, schools, UNM's library and administration building, Monte Vista Fire Station, Roosevelt Park, and many other projects were built. Tingley Beach, Tingley Coliseum and Tingley Drive are named for him.

His wife, **Carrie Tingley**, was known for her personal generosity and attention to the sick, the dying and to children. Carrie Tingley Hospital is named for her.

Dr. **William Lovelace** came here to recover from tuberculosis and started his Albuquerque practice in 1916. His multi-specialty practice, Lovelace Clinic, grew steadily until 1940, when he had 16 doctors. In 1946 his nephew **Randy Lovelace** joined, and they organized the nonprofit Lovelace Foundation for Medical Education and Research. The clinic built a new facility in 1949 on the Southeast Mesa, and Randy Lovelace persuaded the Methodist Church to build Bataan Memorial Methodist Hospital next door in 1952.

In 1975 the clinic and hospital merged with Lovelace Medical Foundation and evolved as Lovelace Health Systems. In 1991 the medical center and health plan were sold to a private health-care provider, and the foundation spun off The Lovelace Respiratory Research Institute as a nonprofit.

In 1940, famous war correspondent **Ernie Pyle** made Albuquerque his home – in between his assignments. He died on a Pacific island in 1945 from a sniper's bullet. He's remembered with the Ernie Pyle Memorial Library, Albuquerque's first branch library, created at his home on Girard in 1948. And a middle school is also named for him.

Street Names

Many of Albuquerque's major streets were named for local individuals.

- Menaul Boulevard originally led to Menaul School, named for Irish-born **James A. Menaul**, who came to Albuquerque in 1881 when the population was 2,200. He organized First Presbyterian Church. In the late 1800s a Presbyterian training school was named for him.
- Eubank Boulevard was named for Lt. Col. (later general) **Eugene L. Eubank** who was commander of the 19th Bombardment Group here. He led 100 bombers on a flight from California across the Pacific during World War II.
- Montgomery Boulevard was named for **Eugene Montgomery**. His family homesteaded on land near what is now Carlisle and Montgomery around 1909, when there were 7,000 people in Albuquerque.
- Spain is named for Dr. **Charles R. Spain**, APS school superintendent from 1957-1965.

- On the West Side, Taylor Ranch and Taylor Ranch Road were named for **Joel and Nina Mae Taylor**. In 1939 the Taylors, then living on his father's homestead in Chama, bought 800 acres of land west of the river and lived in a two-room adobe house where the La Luz subdivision is now, near Montaño Place and Coors Road. This place became their winter haven away from snowy Chama, and there is now a street called Winterhaven there. In 1973, the Taylors sold 300 acres to Bellamah Corp., which created the Taylor Ranch subdivision.
- **Dale Bellamah**, son of Lebanese immigrants, built thousands of houses east of Eubank and left the symbol of a bell imprinted in the concrete. A park and street are named for him. He called his wife Princess Jeanne, and a shopping center, a subdivision and a street have that name.
- You might think Coors is named for the Colorado brewing family, but it's not. It was named for **Henry G. Coors** who was a district attorney and judge in the 1940s and early 1950s.

Modern Albuquerque

A number of facilities are named for public servants. U.S. Sen. **Dennis Chavez** served from 1935 to 1962 and was instrumental in initiating the San Juan-Chama Diversion Project that will deliver water to the city in 2008. A park near I-25 and Gibson bears his name as well as an APS elementary school. In 1966 Chavez, who died in 1962, was honored with a statue in the Capitol Statuary Hall in Washington D.C. as well as a postage stamp in 1991.

U.S. Sen. **Joseph Montoya** served from 1964 to 1977. The Northeast Heights TVI campus, the Montoya campus, is named for him. U.S. Sen. **Pete Domenici** was recently honored by having the new downtown Federal Courthouse named for him.

U.S. Rep. **Steve Schiff** served 10 years and died while in office. His name was given to a post office near Candelaria and Eubank. In 1974 **Harry Kinney** was the first mayor elected under the new city council-mayor form of government. A flood control dam near La Cueva High School is named for Kinney.

State Sen. **Z.B. Moon** served in the 1930s. The street is named for Moon or his family, who were long-time residents.

Alice K. Hoppes, the long-time president of the NAACP in Albuquerque, was instrumental in getting Martin Luther King Jr.'s birthday made a state holiday and in getting a state Office of African American Affairs. Growing up in Tucumcari, she was the only black student and chafed at being excluded from the public swimming pool, having to sit in the balcony of the movie theater and listening to a teacher tell racial jokes. She died in 2004 at 64. The African American Pavilion at the State Fair is named for her.

The military gave us a number of place names in Albuquerque. The developer of Academy Estates in the Northeast Heights chose admirals' names for streets: **Admiral George Dewey** was a hero of the Spanish-American war in 1898; **Admiral William "Bull" Halsey** was a leading naval commander during World War II; **Admiral Chester William Nimitz** commanded the Pacific fleet during World War II; and **Admiral Hyman Rickover** created the Navy's nuclear submarine fleet.

Another developer named streets in the Park Addition, also in the Heights, for generals – Arnold, Bradley, Chennault, Hodges, Marshall, Patch, Somervell, and Stillwell.

The world of sports gave us a number of names. In the 1940s the **Unser** family operated a wrecking service at Unser Garage on 7700 Central SW. The family has raced in every Indianapolis 500 except one since 1964 and won nine times. The small dirt street adjacent to their family home was named Unser.

In 1979 homebuilder Coda Roberson developed the Westwind Subdivision on the West Side and named streets for football stars – Namath, Staubach, Landry, Grogan, and Kilmer.

APS schools take their names from a variety of sources.

Many elementary schools are named for local educators. For example, **Susie Rayos Marmon**, was one of the few Indian girls of her time to pursue an education. She was educated at Menaul School in Albuquerque and Carlisle Indian School in Pennsylvania, graduating from Bloomsburg State Teacher's College in Pennsylvania in 1906. For nearly 50 years she taught in a one room building behind her home in Laguna Pueblo and often served as an advocate for higher education. In 1971 the North American Indian Women's Association named her the Outstanding Indian Woman in Education. She died in 1988 at age 110.

John Baker, a champion runner at both Manzano High School and UNM, won so many races against heavily favored opponents he was dubbed "Upset John." He became a coach at Aspen Elementary School. Training for the 1972 Olympics, he collapsed one day and learned he had terminal cancer. Baker said nothing but kept coaching and gave the Duke City Dashers, a girls team, the last of his energy. He died in 1970 at age 26. The same week the Dashers won the AAU national cross-country championship in St. Louis. His life inspired a book, "The Shining Season," along with two movies. He was so revered that, at the request of his students, the school was renamed in his honor.

Other schools are named for anthropologist (Adolph) Bandelier, soldier and trader Kit Carson, New Mexico colonizer (Juan de) Oñate, and artist Georgia O'Keeffe.

Most of UNM's buildings honor former presidents, faculty, and coaches: Hodgin Hall for **Charles Hodgin**, the first APS superintendent; Zimmerman Library for President **James Zimmerman**, who expanded enrollment and constructed facilities throughout the Depression; Popejoy Hall for President **Tom Popejoy**, who led the development of UNM's schools of medicine, pharmacy, nursing, law and business in the 1950s and 1960s; and Johnson Gym for Coach **Roy Johnson**, who coached every sport at UNM from 1920 to 1959.

Some names are familiar because a well known business carries the name of a founder. For example, **Louis Galles** came to New Mexico in the 1880s as a soldier and in 1900 bought one of the first automobiles in the state. In 1908 he started Galles Motor Co., the city's first car dealership.

Or Mr. Powdrell's Barbeque House, started in 1969 by **Pete Powdrell** and passed to his sons.

Resources:

Garcia, Nasario. Albuquerque Feliz Cumpleaños! Three Centures to Remember.

Gill, Donald. Stories Behind the Street Names of Albuquerque, Santa Fe & Taos.

Rebolledo, Tey Diana, et al. Nuestras Mujeres.

Sando, Joe. Pueblo Profiles.

Simmons, Marc. Albuquerque: A Narrative History

Lesson Plan: Famous Albuquerqueans

Video: "Albuquerque's People of the Heart"

By Rhonda McGee

New Mexico Standards:

Content Standard: Language Arts: Listening and Viewing:
The student demonstrates, analyzes, evaluates, and reflects upon the skills and processes used to communicate by listening to and viewing a variety of auditory and visual works.

Benchmark: The student listens to, views and responds to formal and informal visual and auditory works, including multimedia presentations.

Performance Standard: Students will listen with engagement. Students will summarize main ideas and supporting evidence from a spoken message and formal presentation.

Content Standard, Social Studies: History
Students are able to identify important people and events in order to analyze significant patterns, relationships, themes, ideas, beliefs and turning points in New Mexico.

Benchmark: Describe how contemporary and historical people and events have influenced New Mexico communities and regions.

Performance Standard, Fourth Grade:
Identify important issues, events and individuals from New Mexico prehistory to the present.

Grade: 4th

Duration: 1 ½ to 2 hours.

Setting: Classroom or school library.

Materials:

- Video: "Albuquerque's People of the Heart"
- Video Activity Sheet
- Construction paper
- Art supplies
- Pencil
- Crossword puzzle

Set-up:

Each school library has a copy of "Albuquerque's People of the Heart," courtesy of the Albuquerque Tricentennial Education Task force. Additional copies of the video can be purchased from KNME.

This video is a wonderful way for students to get a glimpse of just a few wonderful individuals that shaped our city for the past century. The students will need a comfortable place to view the video. Have the students gather around a TV/VCR to view the video. Have a short discussion on the importance of some individuals in a community. Give an introduction to the video.

Procedure:

1. Watch the video, “Albuquerque’s People of the Heart.”

2. The students are to complete the activity sheets accompanying the video alone, with a partner or in a cooperative group.

3. After completion of the activity sheet, meet in large group to discuss the video and comprehension questions.

Extension:

1. As an individual lesson, pair lesson or cooperative group lesson, have the students complete the crossword puzzle.

2. Do a research paper on an important present-day citizen of Albuquerque. (Heather Wilson, Sid Gutierrez, James Lewis, Notah Begay, etc.)

3. Write and act-out role plays that show one of these men/women’s lives.

4. Invite a local historian to do a presentation for your class and/or school about Albuquerque’s famous people.

"Albuquerque's People of the Heart"
Activity Sheet

After viewing the video, "Albuquerque's People of the Heart," complete this activity sheet.

1. **Why do you think the video was called "Albuquerque's People of the Heart?"**

2. **Sister Blandina Segale started the first school and hospital in Albuquerque's history. Why was building these two institutions such an important task for her?**

3. **Why did so many people, suffering from tuberculosis, move to our city?**

4. **What two people helped create the Presbyterian Hospital, known as a "san," in 1913 specifically for men and women suffering from tuberculosis?**

5. **During the Great Depression, Clyde Tingley helped expand schools, jobs, roads and other public facilities for Albuquerque. And his wife, Carrie Tingley, was known for her personal generosity and compassion. Name three sites, located in Albuquerque, that bear his or her name.**

6. **Do you think Clyde Tingley's and Carrie Tingley's contribution to the children of Albuquerque in the 1920s still has an impact on our city today? Why or why not?**

7. **In the 1920s, Ruth Hanna McCormick Simms started the Sandia School for Girls. Why was starting a school for girls such a contribution?**

8. **Why is Dennis Chavez seen as one of the first men in the United States to be a civil rights leader?**

9. Dennis Chavez was the first Hispanic in American history to be elected as a representative to the U.S. Congress. What do you think might have been his hardest task being a Hispanic Congressman in the 1950s?

10. John Milne was the superintendent for the Albuquerque Public Schools for 45 years. Name and discuss two important things that happened during his term.

11. Do you agree with John Milne's opinion that bilingualism is an asset? Why or why not?

12. Charlie Morrisey was a humanitarian who helped inspire many people of Albuquerque by contributing to a wide variety of important organizations. Pretend you are helping Ms. Morrisey start a new organization for our city. What kind of program would you start to make our city a better place? Name your organization and explain its philosophy.

13. How has Mr. and Mrs. Salisbury's bill, the Fair Housing Ordinance of Albuquerque, made our city a better place?

14. What two important things is Ben Abruzzo known for starting in our city?

15. John Baker was an incredible teacher. He started a track and field organization for girls, and he inspired his students to work hard, be competitive, and to always do their best. Who is your favorite teacher? Draw a picture of your favorite teacher in the space provided. Write a paragraph explaining why he/she is your favorite next to your picture.

16. Using at least three of the vocabulary words below, write a short paragraph describing one of the men or women you learned about in the video. (Example: Brother Mathias Barrett was a <u>humanitarian</u> who inspired many of the <u>indigent</u> in Albuquerque.)

(humanitarian, convent, indigent, segregation, congressman, discrimination, Great Depression, tuberculosis, historian, educator, community leader, inspiration, sheriff, frontier, adventurer)

17. Pretend it is the year 2050 in Albuquerque, and you are our mayor. Explain two things will you do to make our city a better place?

18. Choose a different person from the one you wrote about on number sixteen. Do a short report on that person. Where was he/she born? How long did he/she live in Albuquerque? What contribution/s did he/she do to help the city of Albuquerque and/or its citizens? Write or type your report. On a sheet of construction paper glue your report to one side. On the other side, make an artistic poster depicting his/her contribution(s).

Where I Live
Villages and Neighborhoods

Albuquerque enjoys a variety of neighborhoods that reflect the city's people, history, growth and development. Some are home to ethnic communities, and others are ethnically diverse. Some are decidedly urban; in others, residents wake up to a rooster's crow. They are historic or modern, close to nature or close to the freeway. They may take their character from downtown, UNM or the volcanoes.

How would you describe your neighborhood?

Boundaries and Dividing Lines

Albuquerque has three distinct dividers – the Rio Grande and the two Interstate highways. The river creates an East Side and a West Side that must be crossed by bridges. Albuquerque has eight bridges along its 15 mile length, and at least one has been controversial. Other major land forms, such as arroyos, golf courses and the volcanic escarpment, divide areas. Arterial streets such as Coors, Montgomery, or Paseo del Norte create barriers and boundaries.

Some neighborhoods are laid out in grids. As early Albuquerque grew east, you find the streets in straight lines running east-west and north-south. Neighborhoods in that area are defined by a traffic light or four-way stop every one-half mile. This is because early planners were recreating in Albuquerque the street systems they were accustomed to elsewhere.

Street Numbers

The system of giving a numerical address to all structures in Albuquerque begins at Central Ave and the railroad tracks. That creates our four quadrants of northeast, southeast, northwest and southwest, which also offers clues about location. For every block north or south of Central, or east and west of the Railroad tracks, the number grows by 100. So the 1200 block of Lomas NW is 12 blocks west of the Railroad tracks. The 5800 block of San Mateo NE is 58 blocks north of Central.

Oldest Neighborhoods

The city that now reaches from the volcanic escarpment to the Sandia and Manzano mountains, from Sandia Pueblo to Isleta Pueblo started out as a loose collection of farms along the river in 1706. Not until the late 1700s were some houses built near San Felipe de Neri Church in what we now call Old Town, and people only lived in them on Sundays. After its first 100 years, Albuquerque began to look like a village.

Atrisco on the West Side is even older than Albuquerque. It too was a collection of farms and ranches, founded in 1703 as a Spanish Land Grant.

As Albuquerque grew and new settlers entered the area, they formed tiny communities named for the most prominent family. In following decades Albuquerque had

such satellite communities as Los Duranes, Los Candelarias, Los Griegos, Los Montaños, Los Poblanos, and Los Gallegos. Most were annexed to the city in the late 1940s.

Los Barelas is typical of these enclaves. Around 1825 Antonio Sandoval, a rancher, dug an extension of the old Griegos-Candelaria Ditch across the valley and south along the sand hills at the valley edge to bring water to the fields south of Albuquerque. More farmers moved in, and soon a small village was formed, called Los Barelas after the largest family in the area.

In the North Valley, Alameda is named for an Indian pueblo that once existed in that area.

We know these places now as neighborhoods. Other villages have retained their identity as communities.

Corrales, named for the corrals of landowner Juan González, dates from the 1700s. It remained a Spanish farming village until after World War II, when artists and writers began to restore old adobe houses.

In 1763 San Miguel de Carnué started on a Spanish Land Grant east of Albuquerque.

Martineztown started when families in the 1800s drove their herds east to the sand hills for summer grazing and camped. The area had a large acequia. Around 1850, Manuel Martín and his wife Anna María decided to settle permanently, and the area came to be known as Los Martínes, and later, Martineztown. Today Martineztown is bounded by Broadway, I-25, Martin Luther King Blvd. and Mountain Road.

After the Railroad

After the railroad came in 1880, Albuquerque began growing quickly. As Americans moved into what had been a Spanish outpost, they began to transform the town in the image of places where they lived before.

The railroad spawned a second town, as stores and saloons sprouted along the tracks in tents and hastily built shacks. Soon the new commercial district gained permanent structures of brick and brownstone. It became known as New Town, and the original community became Old Town.

The first developers hired civil engineer Walter Marmon to design and lay out the streets of New Town. A Midwesterner, Marmon stuck with the familiar. He laid out a grid of numbered north-south streets and named east-west streets after minerals – gold, silver, coal, lead and iron. Local boosters were hopeful that Albuquerque would become a transportation center for the mines. He named the main street parallel to the railroad tracks Broadway because he thought a proper city should have a Broadway. The major arterial was already called Railroad Avenue (later renamed Central Avenue).

A growing community needed new housing. In 1880, the same year the railroad arrived, Franz Huning started his Highland Addition east of the railroad between Copper and Iron. It was Albuquerque's first master-planned suburb. Huning’s new subdivision, with its Midwestern-style Queen Anne homes drew merchants, doctors and professionals. (After a period of decline, the neighborhood is now fashionable again and many of the century-old homes are renovated. Huning Highland was named a national historic district in 1979 and a city historic overlay zone in 1981.)

The second housing development was the Perea Addition of José L. Perea, better known as the Downtown Neighborhood District, west of New Town in 1881.

In 1881 Sister Blandina Segale wrote: “I predict this Old Town Albuquerque will not long remain the metropolis.” Two years earlier when she arrived here, “there was not a house where the railroad station is now but the houses are springing up like mushrooms.”

North of New Town was the Mandell Addition, platted in 1880. Located around Fourth and New York (now Lomas), it became known as the McClellan Park Neighborhood. This was a thriving turn-of-the-century residential neighborhood outside the city limits. Residents converted an old apple orchard into McClellan Park, named in 1919 by prominent citizen William McClellan for his wife and mother. The McClellans lived adjacent to the park. The neighborhood faded away as auto dealerships grew along Fourth Street, which was a part of Route 66 through Albuquerque for a time, and railroad-related warehouses went in near the tracks. You can still see a few of the modest and charming older houses tucked away on First, Second, and Third streets.

In 1891 wholesale grocer Martin Stamm filed a plat for the Terrace Addition to sell house lots south of Central to Hazeldine and east of the city limits to Buena Vista, in the area of present-day TVI. Local people thought it was too far away; it then took an hour by horse and buggy to get there. This addition includes the Silver Hill neighborhood west of Yale on Gold and Silver. There were no water lines, so Stamm drilled his own well and provided water to residents.

As the century turned, one new convenience that stimulated early subdivisions and suburbs was the streetcar. Promoters in those days bought up real estate as a way to promote their transportation companies. Albuquerque Traction Co., organized by in 1903, proposed a loop around the business district and land where it had lots for sale.

Early Growth

In those days a good rain in the Sandias could turn into a flash flood that plunged across the East Mesa through arroyos on its way to the river. Despite that risk, builders continued adding neighborhoods east of downtown.

D.K.B. Sellers was one of the busiest developers of the period. In 1906 he built University Heights south of Central from Yale to Girard. He described it as the “coming aristocratic section of Albuquerque.” He too provided his own waterworks. His two-story water tank is incorporated to a house at 319 Carlisle SE. The next subdivision was the Valley View Addition in 1911.

Both were well outside city limits on the East Mesa. Promoters offered clean air (“Escape the Coal Smoke of Downtown”) and rural life, and the automobile made commuting possible.

In the early 1900s American Lumber Co.’s sawmill north and east of Old Town began processing logs from the Zuni Mountains in western New Mexico. By 1908 it was the largest manufacturing company in the Southwest. It employed more than 1,000 men in Albuquerque. Nearby workers built their homes of wood or adobe. This became the Sawmill Neighborhood.

The railroad had a similar impact on the one-time farming community of Los Barelas. The railroad built its shops east of Barelas on what is now 2nd Street. Ultimately the railroad would employ hundreds of men, and new subdivisions sprang up to house them. To this day Barelas has two distinct types of homes – the adobes of the early Hispanic settlers and the later brick and frame homes. (For the Tricentennial, Barelas will

be celebrated in an opera commissioned by the New Mexico Symphony Orchestra called "Time and Again, Barelas.")

In the same way the Eastern Addition, across the tracks from Barelas, sprang up in 1888 to provide housing to railroad workers. Farther south the community of San José began, probably after 1880, when Hispanic and some black workers at the Santa Fe shops and tie-treating plant settled.

After 1910 only one area bordering on downtown remained undeveloped – a swampy area between the old Barelas Road and the Rio Grande. A real estate company platted the Raynolds Addition between Eighth Street and the city limits (roughly at Seventeenth) in 1912, but little building took place until the late 1930s and 1940s because the city didn't have water and sewer lines in place. The neighborhood is now a combination of small houses built in the 1920s and Southwestern style apartment houses built in the late 1930s and 1940s.

As tuberculosis became the leading threat to health, Albuquerque emerged as a health mecca. The first sanitorium took root on the sandy, unpopulated East Mesa, soon followed by more. The University of New Mexico, long the sole occupant of land east of town, now had company.

Housing Boom

The first housing boom was in 1922 with the Country Club Addition, named for the club to the east. Later known as Spruce Park, this neighborhood has a variety of architectural styles from the period between the two world wars.

Development began in 1925 on Grenada Heights on the East Mesa. Parkland Hills, Knob Heights, Monte Vista and College View followed in 1926. Seventeen subdivisions sprouted in quick succession.

In 1928 lawyer William Keleher and contractor A.R. Hebenstreit acquired land from Franz Huning's heirs and platted the Huning Castle Addition, named for the mansion Huning built on Central and Fourteenth in 1883. Swamps made much of the land unattractive for development, but in 1925 the Middle Rio Grande Conservancy organized and began planning projects to control the river and drain marshy lands. Albuquerque Country Club moved from the East Mesa to its current location in 1928, which added cache to the development. They only got a few homes built before the Stock Market Crash of 1929. Most of the homes in this affluent subdivision, which came to be known as the Country Club neighborhood, were built after World War II.

Today, ten historic neighborhoods surround downtown: Old Town, the Downtown Neighborhoods Area (Perea Addition), Sawmill-Wells Park, McClellan Park, Martineztown (Los Martínes), Huning Highlands (Highland Addition), South Broadway (Eastern Addition, San José), Barelas (Los Barelas), the Raynolds Addition, and Country Club (Huning Castle Addition).

Post-War Boom

The city's biggest growth spurt came after World War II. As Sandia Laboratory was born from a division of Los Alamos Laboratory, and the Cold War got into full swing, a massive influx of new residents poured onto the East Mesa, bringing the city's edge to the Sandia Mountains.

Construction began in the late 1950s on two major interstate highways, I-40 and I-25, which intersected near the center of town, helping to secure the city's importance as a major crossroads of commerce. Albuquerque's population swelled from 35,449 in 1940 to 201,189 in 1960, and the once-small Duke City was feeling some big-city growing pains.

In 1950, the city was rapidly annexing land east and north of its borders, and subdivisions were spreading toward the mountains. That year the Saturday Evening Post wrote of Albuquerque, “New houses go up in batches of 50 to 300 at a time and transform barren mesas before you get back from lunch.” In the four years between 1946 and 1950 the city’s area tripled.

City Commission Chairman Clyde Tingley, back from a stint as governor, urged caution against "checkerboard development" that he said would require more infrastructure than the city could afford. Building continued.

In 1950, Sam Hoffman built the 800-home Hoffmantown Addition north of Menaul and east of Wyoming. In 1953, Ed Snow's Snow Heights Addition followed directly south.

The Bel-Air subdivision, built by Harvey Golightly, initially wanted to incorporate as a separate village. The homes, between Carlisle, San Mateo, Menaul and Candelaria, sold quickly. It was annexed into the city in 1951.

In 1954, Dale Bellamah's 1,600-home Princess Jeanne Park, named for his wife, was built between Lomas and Indian School from Eubank to Juan Tabo. Princess Jeanne offered “wife-planned” homes with fireplaces, spacious patios and such new products as linoleum, Formica and Pulverator disposals.

In the early 1950s Bellamah also built the Kirtland Addition just west of the airport. The first residents were white officers from the base. In 1952 Bill Gooden was the first African American to move in. In a 1991 interview he recalled no problems in integrating the neighborhood: “I met my neighbors on both sides and across the street, and we got along well and we enjoyed living there.”

That encouraged other black families to join them. The affordable but modern homes were a step up for most black residents. Kirtland Addition was a black neighborhood for years, but it’s once again mixed.

West Side

People east of the river sometimes think the West Side just exploded in the last few years. In fact, many West Side neighborhoods are as old as much of the Northeast Heights.

West Side development began in 1951, when homebuilder Leon Watson bought land from Florencio Baca, who had lived there since 1936. The development between Central and Bridge near Coors became Los Altos.

Two other West Side subdivisions date from the post-war boom.

In 1949 the Black family, which owned the Seven Bar Ranch on the West Mesa, sold 8,000 acres to Horizon Land Corp., and in 1961 it began developing Paradise Hills. By 1981 Paradise Hills had 1,800 homes on 12,000 acres and 6,000 residents. The Blacks in 1947 had built a general aviation airport, which became home of Cottonwood Mall.

Taylor Ranch and Eagle Ranch followed in the 1970s.

Resources:

Biebel, Charles D. Making the Most of It: Public Works in Albuquerque during the Great Depression 1929-1942

Davis, Mary. Albuquerque's Environmental Story: http://www.cabq.gov/aes/

Simmons, Marc. Albuquerque: A Narrative History.

Lesson Plan: Albuquerque Neighborhoods

By Linda Spensley

New Mexico Standards:
Language Arts, Strand I: Students will apply strategies and skills to comprehend information that is read, heard, and viewed. Fourth grade: 1, 3, 4.
Mathematics, Measurement: Students will understand measurement systems and applications.
Social Studies, II-B: Distinguish between natural and human characteristics of places and use this knowledge to define regions, their relationships with other regions, and patterns of change.

Objective: Students will learn about the role, history, and diversity, of neighborhoods in and around Albuquerque.

Grade: 4th

Class size: Up to 24

Duration: Flexible (Do just the reading activity for one class period or all the activities for a week)

Setting: Classroom

Materials:

- City Maps (one per two students)
- Rulers
- Dictionaries (different editions would be ideal)

Teacher Note: We have many students in our schools who are homeless, and this topic could be very sensitive for them. You may want to refer to a neighborhood as a student's "school neighborhood" if you have a homeless student in your classroom. (For further information regarding homeless students in The Albuquerque Public Schools, please call the Title I Homeless Project Liaison, Helen Fox, @ 256-8239 x 11, (fox_he@aps.edu).

Background Knowledge:

1. Ask students to brainstorm words that come to mind when they think of the word "neighborhood." Write the words on the board and come up with a class definition. Have pairs of students look up the word in the dictionary and read the definition aloud. (Extension: Have a brief discussion about differences in definitions.)
2. Ask students about the type of home they live in: apartment, house, mobile home, perhaps a hotel.
3. Discuss the surroundings in their neighborhood: rural, suburban, downtown, mountains, mesa, river.

4. Talk about the businesses nearby: gas station, grocery store, restaurant, day care, drug store, etc. Ask why these businesses locate where they do.
5. Help the students come to the conclusion that neighborhoods are diverse communities where people live, play, shop, go to school, and are connected often with reference to some characteristic such as a river, the mountains, the city, a park, a school, etc.

Activities: Choose one or two or use as a unit over a week or longer.

1. **Reading/Writing/History/Vocabulary**
   a) The teacher reviews or students look up the vocabulary words (a bit challenging, so omit words that are not appropriate for your particular students) before they read the article on neighborhoods. (This list can also be used for a spelling list and assessment).
   b) Students partner read or choral read (because it is a bit challenging) the information on Albuquerque neighborhoods and write a paragraph about what makes their neighborhood unique. (This article may be divided into two class periods if needed.

2. **Math/Map Skills/Art**
   a) Students draw and color a map of their neighborhood, including and labeling nearby streets and businesses. (Extensions: Have the students build a diorama of their neighborhood. Students make a small map to scale of their neighborhood or the neighborhood surrounding their school, including a map key.)
   b) In pairs, students use city maps to find their neighborhood and record the coordinates (example, F-7), then measure distances from their neighborhood to important landmarks, such as the airport, the Rio Grande River, the base of the Sandias, the West Mesa, etc.

3. **Research**
   Students research their own neighborhoods using Web sites and information from neighborhood associations, local libraries, The Albuquerque Museum, local citizens, businesses, and community centers to write a report. They can explore the founding, background, historical-cultural nature of their area, preservation sites, and even current issues concerning their community (such as traffic, crime, growth, etc.)

4. **History:** Find out about the history of your neighborhood. Who lived here before you did? (Example: The Alameda area was inhabited by Pueblo Indians before the Spanish settlers came.)

5. **Field Trips:** The Albuquerque Museum, local community centers, walking tour of your neighborhood, early settlements: Old Town.

Assessment:

1. Students write a paragraph or more on what makes their neighborhood or the neighborhood around their school unique.
2. Students take a spelling test on the lesson vocabulary words.
3. Students write a research report on the history, landmarks, and/or issues of their neighborhood.
4. Students create a map of their neighborhood, labeling streets, businesses, parks, schools, etc.
5. Students answer comprehension questions after the reading sessions (Worksheet Included).

Resources

Websites:

www.cabq.gov/museum

www.discoveryschool.com

www.ped.state.nm.us

Vocabulary Words:

1. **GRID**
2. **PERPENDICULAR**
3. **THOROUGHFARE**
4. **THRIVING**
5. **COMMERCIAL**
6. **SUBURB**
7. **OUTLYING**
8. **INFLUX**
9. **INFRASTRUCTURE**
10. **SPURRED**
11. **ECONOMIC**
12. **SEGREGATIONIST**
13. **PREDOMINANTLY**
14. **INTRIGUING**

Vocabulary Words (With definitions loosely compiled and edited from *Webster's NewWorld Dictionary 2nd College Ed., 1986 and Scholastic Children's Dictionary, 2002.)*

1. **GRID:** a set of straight lines that cross each other at right angles to form a pattern of squares, such as roads on a map

2. **PERPENDICULAR:** a line that is at right angles to another line

3. **THOROUGHFARE:** a public street, open at both ends

4. **THRIVING:** doing well, growing, prospering

5. **COMMERCIAL:** to do with buying and selling things

6. **SUBURB:** an area or district on or near the outer edge of a city

7. **OUTLYING:** far out from a certain point or center, remote

8. **INFLUX:** a continual coming in of persons or things

9. **COMMERCE:** the buying and selling of things to make money

10. **INFRASTRUCTURE:** streets, water lines, electric and telephone lines, sewers, etc.

11. **ECONOMIC:** to do with the management and spending of money

12. **SEGREGATIONIST:** a person who favors separation of people of different backgrounds or races

13. **PREDOMINANTLY:** most frequently, noticeably, seen most often

14. **INTRIGUING:** very interesting, fascinating

Neighborhood Vocabulary

E C O N O M I C N N G Z A P R
R W C M S D X X U B T F Z I A
G M G J G I I L R D H K N C L
D N N V M P V R F B O F A I U
T S I N O I T A G E R G E S C
Z V V U L E H G R A O Y P U I
O N I S G P N H S Q U T U B D
L I R S P I Z T Z O G O G U N
Y O H F Y U R L E R H Q F R E
B Y T L J U R T N X F K G B P
J A T G C M T R N T A L W W R
X U R T H N L F E I R P U E E
O X U L F N I N N D E D E M P
P R E D O M I N A N T L Y W N
E L A I C R E M M O C A O H T

COMMERCIAL
ECONOMIC
GRID
INFLUX
INFRASTRUCTURE
INTRIGUING
OUTLYING
PERPENDICULAR
PREDOMINANTLY
SEGREGATIONIST
SPURRED
SUBURB
THOROUGHFARE
THRIVING

Created by Puzzlemaker at DiscoverySchool.com

Assessment
Write about the following ideas:

Tell about the history of your neighborhood.

Why do you think your neighborhood is special?

How would you change your neighborhood?

Describe a neighborhood of the future.

1st Reading Session: Neighborhoods

By Janet Saiers

Introduction

Albuquerque's Tricentennial can truly celebrate its neighborhoods. They are all sizes, shapes, and ages. They're home to many different kinds of people. Some neighborhoods are distinct because of their relationship to the river, nearby churches, schools, businesses or the University of New Mexico. Some neighborhoods are primarily residential and quiet. Others are close to downtown or a shopping center and have nearby restaurants and shops.

Some neighborhoods are more ethnically diverse while others are home to larger numbers of Anglo, Hispanic, Asian, or African-American residents. Some neighborhoods have residents from other countries. Everyone has neighbors whether you live in a house, mobile home, or apartment complex.

In metro Albuquerque, you can live in a rural area with farm animals or in the Sandia or Manzano mountains around Albuquerque.

Sometimes neighborhoods come together to fight a common enemy, such as crime or a dangerous street intersection. The neighborhood might ask for more police protection or street lights. Or it might oppose the closing of a local school.

The diversity of Albuquerque's neighborhoods reflects our 300 years of history. What part of town do you live in? What area are you from?

Some neighborhood names reflect geography: West Mesa, Northeast Heights, South Valley, North Valley, and East Mountains.

Some reflect a nearby institution or business: UNM, Winrock-Coronado, Cottonwood Mall, Fairgrounds. Some reflect a planned area (many of which focus around a golf course): Four Hills, Tanoan, Ventana Ranch, or the Country Club.

The older, historic neighborhoods are near Old Town and Downtown.

What makes a neighborhood?

Many factors have created neighborhoods in Albuquerque and make that neighborhood a unique place:

- Closeness to the river or irrigation ditches
- Having agricultural areas where peoples have chickens, goats, and horses.
- Nearby major streets like Central Ave or Montgomery or Coors.
- Tall trees and grassy lawns in old neighborhoods or the rock and low-water xeriscaping used in new neighborhoods.

Albuquerque's Dividing Lines

Albuquerque has three distinct dividers: the river and the two Interstate freeways. The river creates an East Side and West Side that must be crossed by bridges.

Albuquerque has eight bridges in its 15-mile length. Also, other things, such as arroyos, ditches, railroad tracks and golf courses, divide areas. Arterial streets like Coors, Montgomery or Paseo del Norte create barriers and boundaries.

Some neighborhoods are defined by the square one-half mile streets surrounding them. As Albuquerque grew east of Carlisle and on both sides of Central, you find the grid pattern -- streets in straight lines running east-west and north-south. Neighborhoods in that area are defined by a traffic light or four-way stop every one-half mile.

Similarities and Differences

In some neighborhoods, the houses go together because they're alike. Some neighborhoods only have one-story houses and you rarely see a house with a second story. Other neighborhoods are a mix of different kinds of houses or houses and apartments.

Some older Albuquerque neighborhoods have alleys; in newer neighborhoods you might share a wall with the person behind you.

There are some neighborhoods where you don't see any stores or office buildings and others with streets like Juan Tabo or Menaul or 4th Street that have miles and miles of stores.

Some Albuquerque neighborhoods have gone through changes. For example, some big houses in older neighborhoods have been divided up as apartments. Or families move out of houses on busy streets, and a business moves in. Neighborhoods near UNM or Kirtland Air Force Base, where people are moving in and out pretty often, have more renters and fewer owners. Some neighborhoods are fighting crime.

Some older neighborhoods became run down, but new residents moved in and renovated the old houses.

Street Numbers

The system of giving a numerical address to all structures in Albuquerque begins at Central Avenue and the railroad tracks. That creates our four quadrants of NE, SE, NW, and SW, which helps with basic locations. For every block north or south of Central, or east and west of the railroad tracks, the number grows by 100. So the 1200 block of Lomas NW is 12 blocks west of the railroad tracks. The 5800 block of San Mateo NE is 58 blocks north of Central.

Neighborhood Histories

The city that now reaches from the volcanoes to the Sandia and Manzano mountains, from Sandia Pueblo to Isleta Pueblo, started out as a loose collection of farms

along the river in 1706. In the late 1700s some houses were built near San Felipe de Neri Church, and Old Town began to take shape.

Atrisco on the West Side is even older than Albuquerque. It too was a collection of farms and ranches, founded in 1703.

As Albuquerque grew and new settlers entered the area, they formed tiny communities named for one family, such as Los Barelas, Los Duranes, Los Candelarias, Los Griegos, or Los Montaños. These communities became neighborhoods as the city grew out around them.

Martineztown started when families in the 1800s drove their herds east and camped. Around 1850, Manuel Martín and his wife Anna María decided to settle permanently, and the area came to be known as Los Martínes, and later, Martineztown.

After the Railroad

After the railroad came in 1880, Albuquerque began growing quickly.

A second town grew along the tracks. It became known as New Town, and the original community became Old Town.

The first developers hired civil engineer Walter Marmon to design and lay out the streets of New Town. Marmon was from the Midwest, and he laid out a grid of streets like he knew in the Midwest. He numbered north-south streets and named east-west streets after minerals – gold, silver, coal, lead and iron. The major arterial was already called Railroad Avenue (later renamed Central Avenue).

A growing community needed new housing. In 1880, the same year the railroad arrived, Franz Huning started his Highland Addition east of the railroad between Copper and Iron. It was Albuquerque's first suburb.

The second housing development was the Perea Addition of José L. Perea, better known as the Downtown Neighborhood District, west of New Town in 1881. Others continued to build houses around the downtown area and by 1891 were reaching east to the area where TVI is now.

In those days a good rain in the Sandias could turn into a flash flood that raced across the East Mesa through arroyos on its way to the river. Despite that risk, builders continued adding neighborhoods east of downtown, at a distance from the city limits. Promoters offered clean air (“Escape the Coal Smoke of Downtown”) and rural life. More people were starting to buy cars, and that made commuting possible.

In the early 1900s American Lumber Co.’s sawmill north and east of Old Town began processing logs from the Zuni Mountains in western New Mexico. It employed more than 1,000 men in Albuquerque. Nearby, workers built homes. This became the Sawmill Neighborhood.

The railroad built its shops east of Barelas on what is now 2nd Street and also employed hundreds of men. New subdivisions sprang up on both sides of the tracks to house them.

Today, ten historic neighborhoods surround downtown: Old Town, the Downtown Neighborhoods Area (Perea Addition), Sawmill-Wells Park, McClellan Park, Martineztown (Los Martínes), Huning Highlands (Highland Addition), South Broadway (Eastern Addition, San José), Barelas (Los Barelas), the Raynolds Addition, and Country Club (Huning Castle Addition).

Post-War Boom

The city's biggest growth spurt came after World War II. As Sandia Laboratory was established, a massive influx of new residents poured onto the East Mesa, bringing the city's edge to the Sandia Mountains.

In 1950, Sam Hoffman built the 800-home Hoffmantown Addition north of Menaul and east of Wyoming. In 1953, Ed Snow's Snow Heights Addition followed directly south.

The Bel-Air subdivision, built by Harvey Golightly, initially wanted to incorporate as a separate village. The homes, between Carlisle, San Mateo, Menaul and Candelaria, sold quickly. It was annexed into the city in 1951.

In 1954, Dale Bellamah's 1,600-home Princess Jeanne Park, named for his wife, was built between Lomas and Indian School from Eubank to Juan Tabo. In the early 1950s Bellamah also built the Kirtland Addition just west of the airport.

West Side

Many West Side neighborhoods are as old as much of the Northeast Heights.

Modern West Side development began in 1951, when homebuilder Leon Watson bought land from Florencio Baca, who had lived there since 1936. The development between Central and Bridge near Coors became Los Altos.

Two other West Side subdivisions date from the post-war boom.

In 1949 the Black family, which owned the Seven Bar Ranch on the West Mesa, sold 8,000 acres to Horizon Land Corp., and in 1961 it began developing Paradise Hills. By 1981 Paradise Hills had 1,800 homes on 12,000 acres and 6,000 residents. The Blacks in 1947 had built a general aviation airport, which became home of Cottonwood Mall.

Taylor Ranch and Eagle Ranch followed in the 1970s.

Second Reading Session

See “Albuquerque’s Historic Neighborhoods” by Mary Davis in the 1995 “Albuquerque Environmental Story” at http://www.cabq.gov/aes/s2cental.html.

Tapestry of Cultures

Albuquerqueans sometimes refer to the city as "tri-cultural," meaning Native American, Hispanic and Anglo. In fact, Albuquerque is a city of many cultures, and some have been here a long time.

At its founding in 1706 Albuquerque was a rather homogeneous society.

In the 1800s immigration to the United States increased because of economic strain and political instability in Europe, the result of overpopulation, the shift from an agricultural to an industrial economy, and famine. People came to America looking for opportunities and, in some cases, religious freedom.

When Mexican independence from Spain opened New Mexico to trade with the outside in 1821, the Santa Fe Trail began bringing outsiders here. The change in control, with the United States establishing a post in Albuquerque, brought even more change to the town's ethnic makeup. Newcomers tended to be young men and were both American and European. Many of the merchants married into local families, which gave them social connections.

In 2002 the Albuquerque Arts Alliance conducted a cultural survey that documented 27 cultures in the city, but there are more. Lamentably, not all groups want to call attention to themselves as a result of controversy following 9-11 or because of immigration issues.

How did Albuquerque gain such a variety of cultural groups? Since World War II, employment at Kirtland Air Force Base and Sandia National Laboratories has drawn individuals of diverse origins. UNM began to diversify its student body in the late 1950s and continues to do so. The health-care industry has recruited medical professionals internationally. And U.S. immigration policy on refugees has resulted in increased presence of people from Cuba, Vietnam, and some European countries.

The groups vary in their degree of organization and cohesiveness, but most are active in the community. Through their food, arts and music, they've enriched Albuquerque.

African-American

Census 2000: 13,854

Among the first families to come to New Mexico were black families. Of the 22 heads of households who originally settled Albuquerque, five were identified as Negro or Mulato. In addition African slaves or servants brought here from the Caribbean accompanied many early Spanish expeditions. Spain itself, occupied for centuries by Moorish Arabs or Berbers from North Africa, was quite diverse and so was Mexico, according to UNM Professor Emeritus Cortez Williams.

The first African in New Mexico was the slave Estéban, captured by the Spanish in Morocco. He accompanied shipwreck survivors led by Alvar Nuñez Cabeza de Vaca in his

epic 1530s journey across the Southwest to Mexico. Estéban returned to New Mexico in 1539 as a guide for the Franciscan Marcos de Niza.

Most of the early black people in Albuquerque during the 1600s were free blacks who came up or were brought here from Mexico or other Latin American countries, said Williams.

In 1828 Mexico, which was then independent of Spain, outlawed slavery.

Black trapper James Beckwourth was a member of the American occupation force that took New Mexico in 1846 during the Mexican-American War. After New Mexico became a territory of the United States, an unratified constitution drafted in 1850 banned slavery; the practice was officially abolished in New Mexico in 1861, a year before the U.S. Congress outlawed it.

The first significant wave of African-American immigration to Albuquerque occurred in the late 1870s with the coming of the railroad. Others moved here after serving as Buffalo Soldiers in the Indian Wars of the U.S. Army.

By 1882 the black community was large enough to start one of the city's first Protestant churches, the African Methodist Episcopal Church (now Grant Chapel). It was followed in 1898 by the Mount Olive Baptist Church.

In the late 1880s, when the Territorial Legislature was in the process of creating the University of New Mexico, Fred Simms, a black law clerk in the Rodey Law Firm, took notes for a legislative committee charged with selecting the site. When the committee vote tied between Albuquerque and Santa Fe, Simms was asked to cast the deciding vote, and he chose Albuquerque. That's why UNM is in Albuquerque.

By 1910 the black population reached 244. Many worked for the railroad; others started businesses when discrimination blocked them from getting other jobs. One of the first black-owned businesses was the Bryant Co. messenger service, which in 1910 used a fleet of two automobiles, four bicycles and one horse-drawn wagon.

In 1912 the Albuquerque Independent Society organized; it was renamed the NAACP a year later, one of the organization's earliest chapters. In 1914 women began the Home Circle Club, one of the oldest women's organizations still active in Albuquerque.

African Americans moved into the growing neighborhoods east of the railroad tracks, across from Barelas, along south Broadway. For years they weren't allowed to live in many of the city's other neighborhoods, but this began to change in the 1950s, even before the Civil Rights Movement.

Their numbers were small (547 in 1940 and 613 in 1950) but by 1960 their numbers grew dramatically as many black people came here with the military.

Institutions: 50 churches

Organizations: New Mexico African-American Artists' Guild, Home Circle Club, NAACP

Annual Events: Juneteenth is celebrated in a public venue with performances, food

Cultural Centers: Alice Hoppes African American Pavilion at the State Fairgrounds

Arab

Census 2000: 2,505

The first wave of immigrants began in the late 1800s and ended with World War II. This group was primarily Christian Lebanese. Most of them went into business, often

starting as peddlers until they could open dry goods stores. Two successful descendents of these immigrants were George Maloof and Dale Bellamah.

The late George J. Maloof came from a pioneering Lebanese family that owned a grocery and beer distributorship in Las Vegas, N.M. He came to Albuquerque to open a beer distributorship and amassed a fortune in hotels, banking, alcohol distribution and professional sports teams.

Homebuilder Dale Bellamah built thousands of houses in the Northeast Heights and on the West Side.

The partitioning of Palestine in 1947, followed by Israeli expansion, produced another wave of Arab immigrants. After the 1967 war there was another influx. Still others immigrated in recent years to pursue higher education or take jobs at UNM and Sandia National Laboratories.

Institutions: Islamic Center of Albuquerque

Education: Salaam Academy for Arabs

Organizations: Near East Alliance

Armenian

Estimated population: 150 in Albuquerque

Before World War II only a few Armenians lived in Albuquerque. Two immigrants were Bill and Jack Knadjian, who came here in the 1930s and began selling rugs. In 1954 they opened Knadjian's Oriental Rugs on Central near Presbyterian Hospital. The business celebrated its 50th anniversary in 2004.

After the war, many Armenians who had served at military bases in New Mexico moved to Albuquerque.

Every year Armenians commemorate Martyrs' Day on April 24, to commemorate the loss of an estimated 1.5 million Armenians in genocidal attacks by the Ottoman Turks. The local Armenian community planted a sycamore tree in front of the Albuquerque Museum. Its plaque states: "This tree presented to the Museum of Albuquerque, a living commemoration to the 1915 genocide of the Armenian nation." An Armenian priest is usually brought in from outside the community to conduct the Martyrs' Day ceremony and religious service.

Institutions: Armenian Church of Albuquerque**,** 111 Pennsylvania S.E.

Organizations: Armenian Cultural Association of New Mexico, 111 Pennsylvania St. SE, 87108-3206, 505-268-5522.

Annual Events: Martyrs' Day, April 24th

Cultural Centers: Booth at the New Mexico State Fair; exhibit at the Holocaust Museum downtown.

Celtic

Census 2000: 337

Spanish-speaking Irish and Scots were in New Mexico during the Spanish colonial period. Other Celtic immigrants came to the Southwest with the railroads, as cowboys, and in the military. By the late 1800s Albuquerque had a few dozen Irish people. Most people with Celtic roots arrived in the 20th century during World War II. In recent years, Intel employees from Ireland, where the company has a plant, have moved to Albuquerque.

One notable immigrant was John Milne, a native of Scotland, who came here to recover from tuberculosis. He became a math teacher in the high school and served as Superintendent of Schools for nearly half a century. Another was the Rev. James Menaul, a native of Ireland, who was a Presbyterian minister in Albuquerque for years. Menaul School is named for him.

Organizations: Ancient Order of Hibernians, the Irish-American Club, the Welsh Society

Annual Events: Highland Games in May (Albuquerque) and June (Rio Rancho)

Cultural Centers: UNM Irish language classes and Celtic mythology classes

Chinese

Census 2000: 2,414

In the late 1800s the railroad brought the first Chinese people to New Mexico. In 1885, 33 Chinese lived in Albuquerque. Their numbers grew slowly; by 1900 there were just 41 people, living mostly in the 200 block of West Silver. Most Chinese in Albuquerque owned or worked in laundries.

Discrimination against them was open and rampant throughout the Southwest. When the railroad was completed, and they were no longer needed, Congress passed the Chinese Exclusion Act of 1882, which prohibited immigration by unskilled Chinese laborers. The law wasn't repealed until 1943. Even then the Chinese population was static because of a strict quota system, but that changed with the Civil Rights Act of 1964 and the Immigration and Nationality Act of 1965. Under these new laws, thousands of Chinese people came to the United States to reunite with their families.

Most of the Chinese population in Albuquerque came here because of the 1965 law, as well as the opportunity to attend UNM. Many highly educated Chinese came here to teach or work at Sandia National Laboratories. From the late 1970s through the 1980s, most were from Taiwan, but now most new immigrants are from mainland China. In addition, non-Chinese Americans have been adopting Chinese children, and there are now more than 200 adoptees here.

For more than 50 years, the most visible reminder of Chinese culture was the New Chinatown café, but it closed in 2003. Kim Jew, son of the restaurants founders, is one of Albuquerque's best known photographers.

Institutions: Chinese Baptist Church, Albuquerque Chinese Church, Soka Gakkai Buddhist Temple

Education: Chinese language classes at UNM and APS

Organizations: Chinese American Citizenship Alliance, Chinese Student Friendship Association

Annual Events: Chinese New Year, Moon Festival (fall)

Cultural Centers: Chinese Cultural Center

Artists: Chinese Chorus

Cuban

Cubans entered New Mexico after Fidel Castro came to power in 1959. Many came to Albuquerque because of UNM. Another wave of Cubans came to the city in the 1980s. In 1995 the Santa Fe Archdiocese of the Catholic Church relocated about 3,500 refugees in Albuquerque through their Catholic Charities Immigration Project.

Albuquerque is the home of Cuban novelist Teresa Dovalpage, who wrote "A Girl Like Che Guevara," and dancer Sonaidy Abad.

French

Census 2000: 11,529

The first Frenchmen in New Mexico were Jacques Grolet and Jean L'Archiveque. Spaniards rescued them from Indian slavery in the late 1600s after the LaSalle Expedition in Texas was defeated by Indians. Grolet's name became Gurule, and L'Archiveque became Archibeque.

The brothers Paul and Pierre Mallat journeyed to New Mexico to trade in 1739. Spanish soldiers sent them back to New Orleans. Spain didn't permit its colonies to trade with outside nations, and it sent four other parties of Frenchmen to jail in Chihuahua. When Mexico gained independence from Spain in 1821, and foreigners were welcomed, French trappers began living in Santa Fe.

The Frenchman who would have the greatest impact on Albuquerque was Archbishop Jean Baptiste Lamy, who in 1867 was charged with transforming the Spanish Catholic Church into an American Catholic Church. The Jesuit priests he sent to San Felipe de Neri Church removed Spanish art and added new architectural features.

By 1900, there were 43 French people living in Albuquerque. The city gained more when GIs moved to the city with French brides after World War II.

In 1948 France sent 49 boxcars to all the states, called the Merci Train. It was filled with gifts from French citizens to reciprocate more than 700 American boxcars of relief goods sent to France by individual Americans. Over time Albuquerque's boxcar fell into disrepair. After it was rediscovered, The Alliance Française provided money and labor to restore the boxcar, which now serves as a small museum of French culture at the New Mexico State Fairgrounds.

In recent years, French people have come here because of climate, education, jobs and business opportunities.

Albuquerque has two French wineries: Gruet and Sandia Shadows. In1983 Gilbert Gruet and Farid Himeur started Gruet Wineries, and Philippe Littot started Sandia Shadows. Both grow their grapes near Engle, N.M., near Truth or Consequences.

Organizations: Le Group Française d'Albuquerque (www.zes.aps.edu/wilson/francais.html)

Annual Events: Beaujolais Nouveau Festival in November; Mardi Gras at Pappadeaux's Restaurant; Bastille Day at the state fairgrounds.

Cultural Centers: The Alliance Française (www.afabq.com), 2917 Carlisle Blvd. NE, Suite 211, 87110; 872-9288.

Filipino

Census 2000: 1,530

After the Philippine War of Independence in the late 1800s, Filipinos began to immigrate, and some eventually reached New Mexico, attracted by agricultural jobs and a Spanish-speaking, Catholic population. These agricultural immigrants settled in Grants, Los Lunas, Moriarty, Estancia, and Jemez Springs. Many intermarried with local New Mexicans. By 1910 there were 27 known Filipinos in the state.

Most Filipinos arrived after World War II. A large number of New Mexican soldiers were stationed in the Philippines, and many brought Filipino brides home with them. In addition, Philippine Scouts who served with Americans also immigrated. Later the Public Health Service drafted Filipino medical personnel to serve the Indian Health Service. And Filipino nuns and priests were recruited by the Gallup and Albuquerque Archdiocese and the Canossian Sisters.

Since 1965, when immigration laws established a preferential treatment for professionals, the city has seen an influx of engineers, accountants, nurses, and physicians. Filipinos are one of the fastest growing minority groups in New Mexico.

Organizations: Filipino American Association of New Mexico**;** Filipino American National Historical Society; Philippine Cultural Group of Albuquerque

Annual Events: Santa Cruz de Mayo, in May at San Felipe de Neri Church in Old Town

German

Census 2000: 86,000

Bernardo Bruber, a trader who arrived in 1678, was the first German to come to New Mexico. El Aleman in southern New Mexico was named for him.

More Germans began arriving when the Santa Fe Trail opened in 1821. By 1885 Albuquerque had 188 German-born residents. They were the single largest immigrant group after Hispanics and Americans. Today most of this population is of German descent, rather than German born.

In 1881 they established St. Paul's Lutheran Church, which became known as the German Lutheran Church. They started the Club Germania in the early 1880s to promote German immigration to Albuquerque.

The most prominent immigrant – and someone who would have an enormous impact on Albuquerque – was Franz Huning, who arrived in America at age 21. Intent on reaching California's gold fields, he hired on as a bullwhacker on an ox train, which brought him to New Mexico in 1849. He got a job with an Albuquerque merchant and stayed. He found plenty of Germans for company. Most were serving in the U.S. Army's regimental band.

One of those soldier musicians was Melchior Werner, who had been on the wrong side in the German Revolution in 1848 and fled. When he mustered out of the army in Albuquerque, he opened a store and then a hotel and even served as postmaster.

Huning opened his store in 1857 , invested in real estate and operated a flour mill. He was not only successful but became a mover and shaker in his adopted town and was involved in everything of importance here, from making sure the railroad passed through Albuquerque to starting the first Territorial Fair. In 1883 he built Castle Huning, his mansion, at what is now Central and Laguna.

By 1900 German immigrants were well established in Albuquerque; by 1910 they constituted 20 percent of the city's population. During World War I, when Germany became an enemy, this group saw some prejudice and intimidation but not the violence of other parts of the country. German immigration here slowed considerably after World War I, but World War II produced an increase, primarily by German scientists who had worked on the secret weapons programs at Los Alamos and White Sands, including Dr. Wernher von Braun and many of his fellow scientists, who helped launch the U.S. space program.

Germans who arrived after in this period tried to assimilate quickly because of negative feelings toward Germans and Nazis, which were exacerbated by the media.

Organizations: Edelweiss German-American Club, Enzian Schulplattler, and Alpenland Schulplattler

Annual Events: Oktoberfest, in Rio Rancho and Albuquerque; Fasching, in November at the Edelweiss Club

Cultural Centers: Edelweiss German-American Club

Greek

Census 2000: 2,240

Greeks have been in New Mexico nearly as long as Hispanics. Greeks accompanied Don Juan de Oñate's party of colonists in New Mexico in 1598. One of those people was Juan Griego, from Candia, Greece. (The Spanish word for "Greek" is "Griego.") His descendents settled in the North Valley, and the community Los Griegos was named for them, as was Griegos Road.

The first known Greek immigrants in Albuquerque arrived around 1915, following the Balkan Wars between Greece and Turkey. Thousands of Greek-American immigrants had gone to Greece to fight against the Turks and then returned to America with Greek brides.

Many started businesses. The Paulantis family ran a string of popular restaurants in the early 1900s, including the Liberty Café on Central and Second.

In that time, the American Helenic Educational Progressive Association ran a sanatorium for tuberculosis patients near the present Presbyterian Hospital. Many Greeks came as patients. This sanatorium closed in the 1940s.

In 1944 construction began on St. George's Greek Orthodox Church. With the church as the center of this community, the Greek population steadily increased.

Institutions: St. George's Greek Orthodox Church

Annual Events: Grecian Festival, in October

Hawaiian

Census 2000: 431

More Native Hawaiians now live on the mainland than live in Hawaii. Most Hawaiians in Albuquerque came here for one of three reasons – the military, education or employment, although some came to learn about tribal sovereignty and land rights from American Indian communities here.

Albuquerque has a hula troupe, which makes all of its own costumes and performs at both city events and Native American events. The Hawaiian community of Albuquerque holds an annual *luau*, usually at a local middle school.

Hispanic

Census 2000: 362,752 (Hispanic or Latino)

The history of Albuquerque and New Mexico is largely the history of Hispanics. The first Spaniards entered the state in 1539 with Coronado's expedition. In 1598 they came as colonists. New Mexico remained a Spanish outpost until 1821, when Mexico gained its independence. Albuquerque then became a Mexican outpost, but the major difference was that Mexico permitted trade with the outside. In that year the Santa Fe Trail

opened, and Americans, French and English entered as traders. Those newcomers tended to be young men, and many married into local Hispanic families.

Albuquerque retained its Spanish character until the arrival of the railroad in 1880, when Americans began to pour into the city. Before long language, customs, religion and architecture all showed the effects. The most obvious difference was Old Town, which remained a Spanish village of adobe houses, while New Town exploded two miles away in a profusion of brick and frame houses in styles transplanted from the Midwest and East.

The town's most prominent Hispanic families had been sending their children to the United States to be educated, and so they not only knew English but were familiar with American business practices and customs. In the historic records of significant events in the city are many Hispanic names.

Interestingly, as the city grew in subdivisions to the east, the early affluent neighborhoods excluded only African Americans and Chinese, indicating continued influence and acceptance for the Hispanic population. In the Albuquerque Arts Alliance survey, some people said they didn't experience discrimination until they left New Mexico.

And yet there has been discrimination. One indication is an entire generation of Hispanic people who grew up without learning Spanish because the schools required that English only be spoken. In addition, some parents didn't want their children to speak English with an accent because they feared it would be a barrier to employment.

The Hispanic community has also been a powerful influence in fostering tolerance of other groups. Here are two notable examples: In 1928 the Ku Klux Klan staged a cross burning. Sheriff Tony Ortiz and two deputies appeared and ordered the members to unmask. The Catholic Church ordered its members to avoid the Klan. And during World War II, when New Mexico towns were allowed to vote on whether to send their Japanese citizens to internment camps, Albuquerque never voted because Hispanic people opposed the move.

Today Albuquerque preserves its Hispanic heritage in many ways, from its ambience to its language to its arts, music and food. It's significant that in recent years the National Hispanic Cultural Center was built here.

Hungarian

Census 2000: 2,481

Hungarian migration to New Mexico has been a gradual process, punctuated by small waves brought on by major events. One of the first Hungarian immigrants was a master boot maker, who arrived in the early 1900s in Tucumcari and settled in Gallup. Others were drawn to the state for mining and farming.

During World War II, several scientists who worked on the Manhattan Project were Hungarian, including Edward Teller. Hungarian scientists have also worked at both Los Alamos and at Sandia national laboratories. After the 1956 revolution in Hungary, another wave of Hungarian immigrants came to the state. Today there are Hungarians living all over the state and working in various professions.

The UNM Law School has an exchange program with a Hungarian university, and Hungarians from the local community are part of the selection process.

Organizations: Hungarian-American Club

Annual Events: Hungarian Freedom Day, in March; Saint Stephen's Day, in August ; Hungarian Revolution anniversary, in October; Saint Nicholas Day, in December; all at the Edelweiss Club.

Indian

Census 2000: 1,421

People from India were once referred to as Hindus, to distinguish them from Native American Indians. Today the designation is East Indian.

Albuquerque didn't have a sizable East Indian population until the Immigration and Nationality Act of 1952 allowed entire families to move to the United States. Most of Albuquerque's East Indian population arrived in the 1970s and 1980s. Many were recruited to fill openings here as engineers and scientists the national laboratories or UNM, and many were physicians.

Most of the East Indian immigrants in Albuquerque were English speakers before they left India and earned advanced degrees after they arrived.

Local East Indian people practice all four of the major religions: Hindu, Buddhist, Muslim, and Christian. There are churches, mosques, and temples in Albuquerque but no one place of worship for Hindus.

Two Indian grocery stores cater to this population.

Organizations: Indian Association of New Mexico; Hindu Temple Society; Promotion of Arts, Dances and Musical Instruments of India; India Student Association; Friends of India Association; New Mexico Association of Physicians from India

Annual Events: Navatri (Festival of Nine Days) in October; Diwali (Festival of Lights) in November

Italian

Census 2000: 25,298

Italian immigrants had a big impact on Albuquerque, beginning with the five Italian Jesuit priests sent here by Archbishop Jean Baptiste Lamy in 1868. His orders were to transform the Spanish Catholic Church into the American Catholic Church. The Jesuits added two wooden bell towers, done in Italian baroque style, and removed New Mexican santos from the church and gave them away to parishioners. Replacement art was paintings in wooden frames. With the help of local carpenters, they made hand-carved pews. In 1872 they opened the Holy Family Select School for Boys and in 1873 began publishing the Imprenta del Rio Grande.

The Jesuits formed a bridge between the local Hispanic population and the newcomers – Americans and European immigrants. Later, Italian immigrants maintained this role in New Mexico because they could speak Spanish and English and were accepted in both cultures.

Another Italian to have a major impact on Albuquerque was Sister Blandina Segale, who oversaw the construction of a convent in Old Town and several schools and taught for many years. She was also a staunch and tireless advocate for the poor and sick of any faith.

Many of New Mexico's Italian immigrants arrived in 1880 as railroad workers. Between 1880 and 1900 Italians were concentrated in Bernalillo County. Typically, they saved their money and started businesses. When coal mines opened in 1910, another wave

of Italians came to Raton and Gallup to be miners. Some Italian immigrants farmed in Corrales and near Isleta or raised sheep in Central New Mexico.

By 1910 there were 1,959 Italians in New Mexico, most of them from Northern Italy, who had come here for economic opportunity. Between 1900 and 1920 they were the largest foreign-born group in Albuquerque. Unlike other cities, Albuquerque never had a Little Italy. Italians here spread across the city.

Italian immigrants built many of the city's premier buildings. In 1886 two skilled stone cutters, Gaetano Palladino and Michael Berardinelli, built the first Bernalillo County Courthouse. They also built the ornate, brownstone Nicholas T. Armijo Building.

Italians also financed the construction of some notable buildings. Luigi Puccini, cousin of the famed composer, is responsible for the Puccini building, now home to both the El Rey Theater and Puccini's Golden West Saloon. Oreste Bachechi, a grocer and liquor wholesaler, built both the Savoy Hotel in 1905 and in 1927 the KiMo Theater. His wife Maria Bachechi ran both a dry goods store and the Elms Hotel while raising the couple's six children.

Pompillio Matteucci started the Paris Show Store early in the 1900s.

The best known son of Italian immigrants is Sen. Pete Domenici, the state's longest serving U.S. senator. His family left northern Italy and came to New Mexico in the early 1900s. They operated Montezuma Grocery.

Albuquerque's original Italian community settled primarily between 1st and 8th streets, around Marquette.

Educational Institutions: UNM Italian Studies degree program

Organizations: Club Culturale Italiano; Sons of Italy; Italian-American Club of Rio Rancho

Annual Events: St. Joseph Feast in March; Carnivale before Lent; Columbus Day in October

Japanese

Census 2000: 1,593

It's not known exactly when the first Japanese immigrants arrived in New Mexico and Albuquerque, but it's likely they arrived as other immigrant groups did to work on the railroad. Because many of these people were from an agricultural environment in southern Japan, they settled in the Rio Grande valley between Belen and Bernalillo and established farms. The Yonemotos were one such family, arriving in Albuquerque during the 1920s.

Other Japanese immigrants operated restaurants and other small businesses and were truck farmers. They maintained their language and culture by sending their children to Japan to be educated.

When the United States and Japan went to war in 1941, many Japanese Americans were rounded up and confined in internment camps. New Mexico had two of these camps, in Fort Stanton and Santa Fe, but most of the Japanese held there were not from New Mexico and left the state shortly after their release in 1945.

New Mexicans took a different approach to internment. It was considered a local issue, and communities could vote. Even so, few communities even bothered to vote. The only city in New Mexico that voted to intern its citizens of Japanese descent was Clovis. In Albuquerque Mayor Clyde Tingley wanted to intern the city's Japanese immigrants, but Hispanic groups opposed the policy, and it never came up for a vote.

After the war many Japanese women came to Albuquerque as war brides of servicemen stationed at Kirtland.

One of the most prominent Japanese immigrants is Satoye Ruth Hashimoto, who was named to the New Mexico Women's Hall of Fame in 1989. For years, she represented the Japanese American Citizen's League, taught American citizenship classes in Japanese. She worked for the Civil Liberties Restoration Act of 1988 and was present for the White House signing.

Institutions: Kyokai Japanese Buddhist Community
Education: Japanese language classes at UNM
Organizations: New Mexico Japanese American Citizen League
Annual Events: Aki Matsuri, September at the Japanese Kitchen restaurant

Jewish

Jews have been in the state nearly as long as Hispanics, although the earliest Jewish settlers weren't advertising their religion. Crypto-Jews, Hidden Jews of Spanish descent, moved here from Mexico to avoid discovery during the Spanish Inquisition.

The Catholic Inquisition began in Rome in the early 13th century to find and punish Christian "heretics." It then spread through most of Central and Western Europe. By 1288 the Inquisition was executing Jews as well. Many Jews converted to Christianity to avoid persecution but even then were persecuted. In 1492 practicing Jews were forced out of Spain.

Many of the *conversos* outwardly practiced Christianity but maintained Jewish practices in secret. When Spain sought colonists for the New World, many *conversos* took the opportunity to escape. Beginning in 1580 the Inquisition began in Peru, Colombia, and Mexico. Again *conversos* left, and settled along the Rio Grande, from El Paso to what is now Southern Colorado.

(In recent years scholars began to write about practices of some New Mexico Hispanic families that linked them to Judaism, such as lighting candles on Friday nights, avoiding pork, observing the day of rest on Saturday, and focus on the Old Testament. Some families knew they were once Jewish, others didn't.)

In the 1800s, German repression of Jews combined with economic hard times resulted in another wave of Jewish immigration. Some of these people became peddlers and traders on the Santa Fe Trail. As they were able, they opened stores.

The first of this group was Jacob Solomon Spiegelberg, who arrived with General Stephen Watt Kearney in 1846 as a sutler, when the United States claimed New Mexico during the Mexican-American War. Spiegelberg's Albuquerque employee, Albert Grunsfeld, bought out his boss.

When the railroad arrived, just a handful of Jews lived in Albuquerque. In 1882 a chapter of B'nai Brith, a Jewish fraternal service organization, started in Albuquerque. Its members were largely young men, which also characterizes most Jewish immigrants in New Mexico at the time. As Albuquerque grew, so did its Jewish population.

In 1885 Henry Jaffa, a Jewish merchant and president of the city's Board of Trade, became the first mayor elected after incorporation. Mike Mandell in 1890 was the second mayor. Mandell's business partner, Alfred Grunsfeld (son of Albert Grunsfeld) was a Fourth Ward Alderman from 1895 to 1896 and founded the Commercial Club, the forerunner of the Chamber of Commerce.

In 1897 Jews organized Congregation Albert, named for Grunsfeld. On September 14, 1900 the first synagogue, Temple Albert**,** was dedicated on the corner of Seventh and Gold downtown. (In 1951 a new temple opened on Lead Ave. It moved to its current location in 1984.)

During the 1860s Charles Ilfeld worked first in Taos and then established a firm in Las Vegas. His Charles Ilfeld Co. would become the largest mercantile house in the state. Ilfeld's brother-in-law, Max Nordhaus became general manager. In 1906 the firm expanded into Albuquerque and in 1911 Nordhaus moved here. Five years later the company started the Ilfeld Realty Co., which in 1951 became Alvarado Realty. Max's son Bob was the founder of Sandia Peak Ski Area.

In 1921 a second religious community organized as Congregation B'nai Israel.

Institutions: Temple Albert, Congregation B'Nai Israel, Congregation Nahalat Shalom,

Organizations: New Mexico Jewish Historical Society; Jewish Federation of Greater Albuquerque, 5520 Wyoming Blvd. NE, 821-3214, info@jewishnewmexico.org, http://www.jewishnewmexico.org/

Annual Events: *Chanukah* Festival in December; Yom Ha'atzmaut (Israeli Independence Day) celebration; Yom HaShoah (Holocaust Remembrance Day); Klezmerquerque (music festival) in February

Cultural Centers: Jewish Community Center

Korean

Census 2000: 1,125

Most Koreans came here after the Korean War as brides of servicemen or as orphans adopted by Americans. The Immigration and Nationality Act of 1965, which abolished quotas based on national origin, started another wave of Korean immigration. By the 1980s Koreans had become the third largest immigrant group in the U.S. Numbers have declined since then as South Korea's economy has improved.

One of the strongest cultural organizations for the local Korean community is the Protestant church. There are three Korean Protestant churches in the area – Presbyterian, Methodist, and Baptist. This has to do with social resistance to Japan at home, and the church continued to be a focus of Korean communal activity in the United States.

Institutions: Korean Presbyterian Church, 2200 Chelwood NE, http://www.jesuskorea.org/kpc_church.html; Korean United Methodist Church, 601 Tyler NE; Korean American Baptist Church, 3315 Tower SW.

Organizations: Korean American Society

Annual Events: Korean Festival, at the Korean Community Center; Sollal (Korean New Year) in early winter;

Cultural Centers: Korean Community Center and Language School, 9607 Menaul NE

Latin American

Census 2000: 871 South American, 826 Central American

The largest populations in Albuquerque are Colombian, Peruvian, Chilean, Panamanian, El Salvadorian, and Guatemalan.

Most Central and South Americans in Albuquerque have arrived over the last 30 years. Some came here with American spouses, others for education and job opportunities. The fact that Spanish is spoken here was also a factor.

Education: Quichua and Quechua classes at UNM

Organizations: UNM's Brazil Club

Annual Events: Carnival, at Tucanos Brazilian Grill; Bolivian Independence Day, August 6; Chilean Independence Day, Sept. 19

Mexican

Census 2000: 68,537 (est.)

This ethnic population is one of the largest and also the most fluid. There is no central organization, but the Mexican culture is in no danger of disappearing in New Mexico.

Most of the Mexicans who have recently arrived in Albuquerque came from northern Mexico, usually the state of Chihuahua. Many Mexicans here aren't immigrants; they're here to earn some money and then return home.

Jobs are the magnet, but Mexicans come to Albuquerque in particular because of its proximity to the border, its vibrant construction market, its established underground Mexican community and social infrastructure, and the city's support of Mexican culture. In fact, much of what we consider New Mexican culture is actually Mexican. For example, New Mexicans enthusiastically celebrate the Mexican holiday of Cinco de Mayo, as well as the Feast Day of the Virgin of Guadalupe.

Institutions: Mexican Consulate, 1610 4th St. NW, 247-2139

Annual Events: Feast Day of the Virgin of Guadalupe, in December in the South Broadway Neighborhood and in San José; Cinco de Mayo, on May 5; Mariachi Spectacular, in July.

Native American

Census 2000: 57,555

People have lived in the Middle Rio Grande Valley for thousands of years, but the Pueblo culture familiar to us now dates from about 900 A.D. At one time there were about 40 pueblos in the Albuquerque area. Athabaskan people (Apaches and Navajos) have been here since about 1400, although archeologists now say their arrival may have been earlier.

New Mexico today has 19 Pueblo tribes, each operating autonomously, along with two Apache tribes, and the Navajo Nation. Albuquerque's closest neighbors are Sandia and Isleta pueblos and the To'hajiilee Chapter of the Navajo Nation.

Living in Albuquerque are members of 40 tribes. The largest group represented is the Navajo tribe with 22,072 (14,183 full-blooded), followed by Pueblo tribes at 12,622 (7,927 full-blooded). Apaches numbered 1,896 (1,086 full-blooded). Cherokee and Sioux tribes both have local populations of more than 1,000.

The Albuquerque Indian Center reports that there are 35,000 American Indians from more than 150 different tribes living in the city of Albuquerque.

Indian people here initially resisted the Spaniards when they arrived here in 1540, and isolated rebellions continued until 1680 when the Pueblos, along with the Apache and Navajo allies, joined to drive the Spanish from New Mexico. After the reconquest in 1692,

Spaniards moderated the practices that had offended native people. Eventually Pueblos and Spaniards joined to resist raids by Navajos, Apaches and, later, Comanches.

After the railroad arrived, and the earliest tourism began in earnest, native artisans found a market for their wares. Traders and merchants also began buying Indian arts and crafts for resale, and a new industry was born. The Alvarado Hotel once employed many Native Americans, and the complex included an Indian Building that featured artists and weavers at work.

In 1881 the Presbyterians contracted with the government to open the U.S. Indian Training School, which the government took over in 1886. A century later the growing availability of public schools on or near reservations reduced the need for government boarding schools. Albuquerque Indian School was transferred to Santa Fe. The buildings were razed in 1987. Many Native Americans attended this school and remained in Albuquerque after graduation.

In 1971 the Southwest Indian Polytechnic Institute was established to serve as a vocational post-secondary school for Indian students throughout the region. It has about 400 students.

Many Native Americans come to Albuquerque for jobs but intend to return to the reservation. Artisans live here or visit to maintain relationships with traders and galleries. Still others, from out of state, live here because they're treated better in Albuquerque than they are at home.

Education: Southwest Indian Polytechnic Institute; Native American Studies Program at UNM; Digital Pueblo Project at UNM

Organizations: Laguna Colony of Albuquerque; Kiva Club at UNM

Annual Events: Gathering of Nations Pow-Wow, in April at The Pit;

Cultural Centers: Indian Pueblo Cultural Center; Albuquerque Indian Center

Persian (Iranian)

Census 2000: 617

Few Persian people lived here until the revolution of 1979, when political and religious oppression caused many Iranians to leave their country. Also, the Ayatollah Khomeini seized private wealth for the state, prompting the departure of the nation's professionals. And educated women who wanted to work found it necessary to leave.

As a result, many Iranian immigrants were educated and spoke English when they arrived and found jobs teaching in universities. Others started businesses.

In recent years, after 9-11, some Iranian immigrants have experienced prejudice, harassment, vandalism and occasional violence. This has led some to call themselves "Persian," rather than "Iranian." Others prefer the term "Persian" to separate themselves from the extremism of the current government in Iran.

Persians have come to Albuquerque for jobs and education. They have also said the terrain looks like their native country.

Organizations: Iranian Cultural Society of New Mexico (www.icsnm.com)

Annual Events: Eide-Fetr (feast following Ramadan), at UNM; No Ruz (Persian New Year), in March at UNM

Polish

Most Polish people came here in the 1980s, after political turmoil in Poland and included a large number of skilled workers and college professors. They came to Albuquerque for jobs at UNM and the laboratories. Still others have moved from Polish communities in the Northeast for jobs, education or retirement. Many of the nuns who run St. Felix Pantry, a charitable food distribution center in Rio Rancho, are Polish-Americans.

Stanislaw Ulam was a mathematician and scientist who helped in the development of the hydrogen bomb in Los Alamos and was one of the first to recognize the potential of computers in scientific research.

Annual Events: Smigus-Dyngus, after Easter at the German-American Club

Russian

Census 2000: 4,000+

Russians came to Albuquerque in four waves: after the 1917 Bolshevik Revolution, after World War II, in the 1970s (Soviet Jews known as "refuseniks"), and after the Cold War ended. This most recent group is largely made up of scientists, engineers and professionals who came here to work in the national laboratories.

Institutions: All Saints of North America Church; Russian Orthodox Church Outside of Russia (Santa Fe)

Annual Events: Harvest Festival at All Saints of North America Church, http://www.allsaintsofnorthamerica.net/.

Scandinavian

Most Scandinavians in Albuquerque are second, third, and fourth generation descendants of earlier immigrants who settled in the Midwest and then left because of economic conditions. Others came here to recover from tuberculosis. More recent arrivals to Albuquerque have come as members of the military or as students at UNM and stayed. Still others liked the warm, dry climate.

A notable example of Scandinavian architecture in Albuquerque is The Whittlesey House, visible west of I-25 and south of Central. Now home of the Albuquerque Press Club, it was built by architect Charles Whittlesey, who trained in Norway. It is a wood framed, log house modeled on a Scandinavian hunting lodge. Whittlesey designed both the Alvarado Hotel in Albuquerque and El Tovar at the Grand Canyon.

Organizations: Scandinavian Club

Annual Events: Midsummerfest; Julfest

Spanish

Spaniards settled New Mexico in the late 1500s, but their descendents are usually regarded as New Mexicans, not Spaniards. More recent Spanish immigration is difficult to track through the Census because some New Mexicans identify themselves as Spanish.

Still, Spaniards have immigrated to New Mexico in small but steady numbers through most of the 20th century, either as emissaries of the Spanish government or as spouses of military personnel who have been stationed in Spain.

The most prominent and common Spanish art form found in Albuquerque is flamenco dance and music. Most of the Albuquerque practitioners are not Spaniards, but rather New Mexican descendants of earlier Spanish immigrants who came to New Mexico before flamenco was popularized in Spain.

Institutions: The Instituto Cervantes, **www.cervantes.es** and **albuquerque.cervantes.es**

Organizations: Club de España, candelariamcrespo@hotmail.com.

Annual Events: Festival Flamenco Internacional de Albuquerque, in June at UNM

Cultural Centers: National Hispanic Cultural Center

Sub-Saharan African

Census 2000: 1,416.

The Sub-Saharan region includes 47 countries, each with its own cultures and languages. Many are represented in Albuquerque, but no single one has large numbers.

Most came here as students or to teach. Kenyans came here in numbers after World War II and a revolution in their country, when the United States airlifted Kenyans here to receive training to implement a democracy. Some returned home and others remained. Since then Kenyans have come in a steady stream, primarily to UNM.

Albuquerque also has small communities of people from Nigeria, Zimbabwe, Botswana, Senegal, and South Africa.

Institutions: African dance classes at UNM; Panjea Foundation for Cultural Education

Organizations: Africa's Friends Reaching the International Community for Africa (AFRICA) at UNM

Cultural Centers: Maple Street Community Dance Space

Vietnamese

Census 2000: 2,829

The first Vietnamese immigrants came to Albuquerque in 1972, when an American serviceman brought his Vietnamese wife and stepchildren to Kirtland Air Force Base. Vietnamese immigration began in earnest in 1975 when South Vietnam fell. In the next two years the U.S. State Department had a resettlement program that brought about 3,000 Vietnamese to New Mexico. Since then, others have joined family and friends who were already in Albuquerque.

In 1989 the State Department allowed open immigration from Vietnam, and another wave of immigration began, typically of older, educated men who served in the Vietnamese army and were interred as political prisoners following the war.

Organizations: Asian American Association; Vietnamese Mutual Assistance Association

Annual Events: Tet Nguyen Dan (Vietnamese New Year) in spring; Memorial Day, April 30 to remember the journey to America and the people who perished on the way.

Resources:

Albuquerque Arts Alliance Cultural Survey:
http://www.abqarts.org/cultural/survey/index.htm

Garcia, Nasario. Albuquerque Feliz Cumpleaños! Three Centures to Remember.

Simmons, Marc. Albuquerque: A Narrative History.

Lesson Plan 1: Tapestry of Cultures

Examples of Cultural Characteristics

By Bernice Fiske and Vivian Arviso

New Mexico Standards

Social Studies: I-B:4.1; III-A:4.1
Language Arts: I-C:4.5, II-A:4.1

Objectives:

The students will identify cultural strands we share as Americans and those which represent their families' cultural heritages. Students will utilize a chart to compare the cultural practices of three New Mexico cultures through the 1800s.

Grade: 4th

Duration: One hour

Setting: Classroom

Preparation: Make an overhead copy of teacher's "New Mexico Cultures" worksheet, and student copies.

Materials:

- Paper and pencil
- Student and teacher's "New Mexico Cultures" worksheets

Set-up: Discussion to identify our commonalities as Americans.
Sample Introduction: "Native American beliefs teach that they have always been here. However, many people believe that all people in North America came from somewhere else and that they came at different times. Native Americans are ancient upon this land and some people from other countries came yesterday. As each group arrived, they brought their culture -- their customs and way of life -- with them."

Have students number their papers from 1-7 and answer these questions:

1. What language do you speak most?
2. Name a holiday your family celebrates in July.
3. Name one your family celebrates in late November.
4. What are you wearing today?
5. What is your favorite food and what country was it originally from?
6. What is your favorite kind of music?
7. What do you like to do for fun?"

When they are finished have various students share answers. Summarize them: “Most of you said you speak English, celebrate the 4th of July and Thanksgiving, wear jeans, . . .” Point out that these things form the modern culture of the United States. If they visited another country, they would be identified as Americans by the way they spoke English, their clothing, the food and music they liked, what they did for fun and their customs in how they treated other people.

Sample transition: “You named some things about the American way of life, but you may have another culture, too. At home your family or older relatives may speak another language. You may celebrate different holidays by eating special foods, by singing or dancing to traditional music and wearing certain clothes. We are going to study about some people who settled around Albuquerque a long time ago. Who do you think were the first people around here?”

Procedures:

1. Pass out “New Mexico Cultures” worksheets. Have students name the headings on each column. These are some major characteristics of cultures. Through questioning have students read enough of the chart to become familiar with the cultural information.

2. Play “Who Am I?” Students will select two or three characteristics of a cultural group and write them down. (For example: I am a woman who wears beautiful dresses and lives in a hacienda.) Individuals may read their clues for others to identify the culture or the clues may be put in a box and selected at random.

3. To build on this lesson, other strands such as musical instruments or art might be added or other cultures could be included.

Assessment

Did students demonstrate an understanding of the cultural differences in the groups?

Lesson Plan 2: Tapestry of Cultures

Albuquerque's Cultural Diversity

By Bernice Fiske and Vivian Arviso

New Mexico Standards:
Social Studies: II-E:4.3, III-B:4.s
Math: Geo.2

Objectives: The students will list a number of cultural groups that settled in Albuquerque. They will complete a pie chart to indicate relative sizes of the populations.

Grade: 4th

Duration: One hour

Setting: Classroom

Preparation:
Make an overhead copy of "Modern Albuquerque Cultures" pie chart (or work on the board) and student copies. Much of the narrative information is summarized in several sources on the City of Albuquerque's website. (www.cabq.gov) You might want to download them to do your own narrative. On the home page click A-Z and go to "Albuquerque's Environmental Story: Cultural Diversity." For greater detail, see the Albuquerque Arts Alliance survey at http://www.abqarts.org/cultural/survey/index.htm

Student Preparation: A day or so before the lesson have students ask their parents when their families moved to Albuquerque.

Materials:

- Student pie chart worksheet
- Rulers, pencils, and crayons or colored pencils

Set Up:
"Some people have been in Albuquerque a very long time and others have moved here recently." Have students raise hands to find whose family has lived in Albuquerque the longest and the shortest.

Procedure:
Provide information on a cultural group, then have students section off the pie graph to show what percentage of the population is represented by the group. The graph is divided into tenths. Demonstrate how to estimate the size needed and use a ruler to draw a beginning line from the top mark to the center dot. Percentages have been rounded to add up to 100%.

Sample Narrative

"In the year 2000 there were about 400,000 people in the city of Albuquerque. This doesn't count Los Ranchos, Rio Rancho, Corrales or those who live in the county. (Show the pie chart.) "This is a pie chart. We're going to divide up the pie to show what parts of the population is Hispanic, Anglo and so on. A pie chart is like a big silver dollar. Each cent will stand for a part of the people. The small lines stand for ten cents to make it easier for us to divide it up.

"What group of people actually started Albuquerque? . . . Yes, the Spanish in 1706. They first settled in the Old Town area and later spread out into other parts of town as Albuquerque grew. Over the years they married people of other races and cultures so after 300 years, few, if any, remain who are pure Spanish. Spanish speaking people from Mexico, Cuba, Central and South America also moved here. Sometimes this mixture of people is called "Latino" or "Chicano." We're going to call them "Hispanic," which means they have their roots in Spain. About 133,000 people in Albuquerque are of Hispanic origin. That would be 36 cents or 36 per cent on our chart."

(Demonstrate on your overhead or board copy how to count 3 tens and estimate 6 more units from the top mark. Have them draw a line from the center and label the section "Hispanic." Continue narrating and marking charts.)

"The largest group is called "Anglo." Perhaps it is largest because it includes so many different European people. Anglo means "English" and the first were English speaking Americans in the 1800s. Some were traders, and some came with the army and settled here with their families. When the railroad came to Albuquerque, it brought many Americans and many people from other European countries. Some, like the Irish, spoke English. There were also Germans, Italians, Greeks, Jews and many others who spoke their own languages. Today "Anglo" means any white person who is not Hispanic. About 57% are included in this group.

"A few people of African descent, now called African Americans, came to New Mexico with the early Spanish explorers in the 1500s. During the 1800s the Buffalo Soldiers were units with the U.S. Army, and some were stationed here. In the 1860s after the Civil War many former slaves came to New Mexico from the Southern states and Texas. In the 1900s many more African Americans were stationed on the military bases and decided to make Albuquerque their home. They are about 3% of the population.

"Asians are another group that covers a wide variety of people. In the world populations there are more Asians than any other group of people. They live in many different countries, speak different languages and have their own culture. The first Asians in Albuquerque were Chinese and came here to build the railroad in the 1880s. Today there are also Japanese, Koreans, Thais, Vietnamese and other Asian families, but they are only 1% on our pie chart.

"The area around Albuquerque was first settled by the Pueblo Indians. Many have jobs here, but not many live in the city itself. Their homes are in nearby pueblos like Sandia, Isleta, and Acoma. Other Native Americans who live here include Navajos, Apaches, and tribes from other states. Altogether they are 3% of the city's population. (No additional line is needed here.)

Have the students add the numbers to see if they total 100. Tell them some of the numbers were actually a little bigger or smaller, but it was too hard to do an exact chart with fractions unless they had a computer draw it. You may want them to color the sections. Students may discuss the chart to decide if this seems to be like their neighborhood. Point out that some families have lived in Albuquerque since the 1700s and stayed in their old neighborhoods or near them. As some ethnic groups settled here, like Italians, Greeks, etc. they felt more at home moving near other people who spoke their language and were more like them.

Assessment

During discussions did students understand that the categories included a range of very different people? Were students able to complete their pie charts correctly?

Pie Chart

Lesson Plan 3: Tapestry of Cultures
Cultural Exchanges

By Bernice Fiske and Vivian Arviso

New Mexico Standards
Social Studies: I-C:4.1, III-B:4.1
Language Arts: I-C:4.5, I-D:4.5, II-A:4.1
Arts, Visual: 2:A-2

Objectives: The students will identify a personal exchange of skills or knowledge in which there was a mutual benefit. They will portray an exchange of skills, knowledge or goods between cultural groups.

Grade: 4th

Duration: One hour

Setting: Individuals

Materials
- Art paper, paint , brushes (or whatever medium you prefer)
- Worksheet, "Cultural Exchange"

Preparation: Run enough copies of the "Cultural Exchange" worksheets for each student to have an example. Cut sections apart.

Set Up:
Sample intro
"It is the job of parents and teachers to teach you how to do things and give you the information you need. But you learn a lot of worthwhile things from other people. Maybe it wasn't your mother who taught you how to tie a bow. Maybe it was your next door neighbor, and then you did something for him or her. Take a few minutes and think about something someone taught you how to do or told you that has been valuable to you. After a short time have a few students share their experiences.

Procedure:
Sample background information

"You have studied the three main groups of people in New Mexico by the 1800s. They were . . ." (student responses) "Each of the groups had things like sheep or foods that were important. Each had learned how to do things or had invented things or discovered things that were useful. When the groups came in contact with one another, they had an exchange. They shared information or skills or traded for a variety of things."

(Show the cut apart "Cultural Exchange" descriptions.) "Each of these tells about how the Native Americans, Spanish and Americans had an exchange. Some exchanges were between all three groups. You'll each get a description.

There are seven, so some of you will be doing the same one. You are to draw a picture of it. Think of a good title for your picture"

Display the pictures pinned together like a tapestry. Discuss the exchanges.

Evaluation

Did students demonstrate an understanding of exchanging information or skills in their personal example? Was the picture representative of the information of the cultural example? Did the title express a main concept?

CULTURAL EXCHANGE

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1. The Spaniards first brought sheep to New Mexico. Later Navajos raised sheep for food and wool. The women spun the wool into yarn. They wove it into blankets and rugs. The blankets were traded to the Spaniards and Anglo Americans for food and goods like tools and knives.

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2. The Spaniards taught silver smithing to the Native Americans. Navajos and Pueblos made jewelry. Some added turquoise stones. The jewelry was traded to the Spaniards who used it to decorate their clothing, saddles and bridles. It was traded to the Anglo Americans for food and goods like tools and knives.

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3. The Pueblo Indians had long made their homes of puddled mud, stiff damp layers of mud 15 to 20 inches high. Some of their structures were three or four stories high. The Spanish tradition of making adobe (mixing straw into the clay and dirt and forming sun-baked bricks) was brought to the New World. Adobe was actually an Arabic word. The Spanish built their houses from adobe, but often changed the design to include a central patio. The Anglo Americans learned from the Spanish, but used their own designs. When the railroad was completed, it brought many kinds of building materials from the eastern states, including glass windows.

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4. The Pueblo Indians were experienced in managing water flows to irrigate their fields. The tradition of digging irrigation channels (acequias) to manage river water and developing political control over the water distribution system was brought to the New World by the Spanish. The Spanish taught the Pueblo People from San Juan Pueblo to build the first acequias (also an Arabic word) in New Mexico. The Anglo Americans learned from the Spanish and brought equipment to drill wells for water so they didn't have to live by the river.

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5. The Pueblo Indians shared their farming techniques for growing corn, beans and squash with the Spanish. The Spaniards shared new crops such as chile and tomatoes they brought from Mexico. Both the Spanish and the Anglo Americans herded cattle. From the eastern part of the United States onions, lettuce and other vegetables were introduced. Today these are staples of New Mexican food!

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6. Anglo American traders, along with the Spanish, also brought cloth, cooking utensils, beads, tools and other goods, which they traded for Indian pottery, jewelry, rugs, and blankets.

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7. After the railroad was completed in the 1890s, the Anglo Americans brought lumber, bricks, glass, tools, cloth, and many other goods from the eastern United States, which was bought or traded for by other Americans, Spanish and Native Americans.

Lesson Plan 4: Tapestry of Cultures
Feast or Recipe Book

By Bernice Fiske and Vivian Arviso

New Mexico Standards:
Social Studies, Geography: II-C, 4.1

Objectives:
1. The student will appreciate that the city of Albuquerque has developed a unique ethnic cuisine that is Southwestern or New Mexican and is representative of its historic ethnic population.
2. The student will identify Old World foods that were brought to New Mexico by the Spanish and foods grown by Native Americans in the New World.
3. The student will bring their favorite ethnic recipe that can be placed into a class booklet or will choose one to make as a class project.

Grade: 4th

Duration: 45 minutes

Setting: Classroom

Materials:
- Paper and Pencil
- List: *Origin of Food Crops*
- Worksheet: *Searching for Foods*
- Student Recipes
- Worksheet: *Word Search*

Background:

For 300 years, the city of Albuquerque has been a blending of cultural ways, particularly in the area of foods. New foods from the Old World came with the Spanish who arrived as settlers to establish irrigated farmlands and to raise livestock. In the census of 1822, there were 297 who identified their occupation as farmers. They built their settlements on fertile lands along the Rio Grande River and adopted the foods grown in the New World.

One indication of the wealth of lands surrounding Albuquerque is the fact that one individual, Mariano Yrizarri, owned a herd of 100,000 sheep in the mid-1800s. Another indication is that in the four years between 1846-1850, raids by Navajos in the Rio Grande Valley netted 450,000 sheep and 31,000 cattle.

Mexico added more New World foods, especially after 1821 when trade increased after Mexico gained its independence from Spain. Because Mexico, including New Mexico, was now opened for trade, Europeans and Americans began coming here.

After the Mexican-American War of 1846, New Mexico became a U.S. Territory. Albuquerque absorbed Europeans who were Jews, Greeks, Irish,

Italians, Germans, and French. Those people brought their favorite foods, herbs and spices from the Old World.

Today, the Tiwa speaking pueblos of Sandia Pueblo and Isleta Pueblo border the city on the north and the south respectively. Their foods are a combination of the Old and the New Worlds that met in New Mexico. Indication from excavations on prehistoric sites along the Rio Grande River indicates that a large indigenous population of Native Americans once lived in the same area. Inside the metropolitan area today, there is a current population of 25,000 Native Americans from many of the 500 federally recognized tribes in the United States.

New Mexico cuisine is recognized around the world. Foods from the New World have been mixed with foods from the Old World to create memorable recipes. This lesson will encourage students to ask questions regarding the growth of the city and its unique history under Spain, Mexico, and the United States. It will allow students to learn what foods are considered to be native to New Mexico and what foods were brought into New Mexico.

Set-up

A. Introduce this lesson by engaging students in a whole class discussion that will encourage participation through sharing their knowledge about foods.

1. Ask students to contribute their experiences in visiting eateries within Albuquerque.

2. Have students identify a food dish and determine the culture that produced these specific foods, such as spaghetti (Italian), stir-fry or fried rice (Chinese), fry bread or oven bread (Native American), etc.

B. Inform students before this lesson that they will need to bring their favorite recipe from an ethnic group to class and give them the date.

1. Tell students to find a recipe from their own or any other ethnic group which identifies the ingredients and how to make the particular food.

2. Explain that the class will either make a booklet of recipes or choose a recipe to be made as a class project.

C. If the class is to make a recipe, encourage students to wear appropriate clothing during their class project to make a recipe and give them the date for this activity.

Procedure:

1. Ask students to draw a map of the city of Albuquerque on a piece of paper by identifying its borders with Sandia Pueblo to the north, Isleta Pueblo to the south, the Sandia Mountains and the Manzano Mountains on the eastern side of

the map with the Tijeras Canyon dividing them, and place the Rio Grande River flowing through the city.

2. Discuss with students what geographic feature on the map would have had the most influence on early settlers who were farmers and had herds of animals. (Answer: the Rio Grande River.) Why? (Answer: Farmers need water for their plants and animals.)

3. Have students identify where the population in Albuquerque lived in 1706. (Answer: Old Town near the Rio Grande River. People would hand carry their water from the Rio Grande to their homes.)

4. Have students describe where people live today in Albuquerque and give the reason why people can live farther away from the Rio Grande River. (Answer: Water can be accessed by drilling deep wells and water lines can carry water farther away from its source.)

5. Explain to students that the Southwestern cuisine or New Mexican foods served in local restaurants in Albuquerque is known throughout the world and ask students to name some of the foods used as ingredients in this cooking. (Answer: beans, corn, squash, chile.)

6. Tell students that food crops can be separated into those that came from the Old World (Europe) and those that originated in the New World (North and South America).

7. Distribute the listing of Old World and New World Food Crops and review these items with students.

8. Divide students into groups of three and assign each group to analyze their recipes for food crops that are Old World or New World using the worksheet, *Searching for Foods.*

9. Have each group give an oral report to this class describing the culture that their recipes represent and explaining how many food crops in their recipes were Old World and how many were New World.

10. Inform students about the procedures for collecting the recipes into a booklet for the class or selecting the recipe for their class project.

11. Encourage students to continue to learn about different foods, their origin and the recipes in which these foods are used to cook different meals.

12. Thank students for their efforts to learn about the origin of food crops and identifying those that are New World and those that are Old World.

Assessment

1. Students will correctly analyze their recipes on the *Searching for Foods* worksheet and list food crops in the categories of Old World and New World.
2. Students will participate through bringing a recipe for the class booklet or assist with the making of a chosen recipe.

Extension: Students may complete in class or take home the Word Search activity containing foods from the Old World and New World.

Searching for Foods

Directions: Take your recipe and identify the food crops that are its ingredients. Decide if the origin of the food crop is Old World (European) or New World (North and South America) and write the name in the selected column.

Old World Foods	New World Foods
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

_____ _____

_____ _____

Origin of Food Crops

New World Foods (North and South America)

Beans

Cacao

Corn

Gourds

Peanuts

Peppers (Chile)

Pineapples

Pumpkins

Potatoes

Squash

Strawberries

Old World Foods (Europe)

Beets

Broccoli

Carrots

Eggplant

Lettuce

Okra

Onions

Peas

Radishes

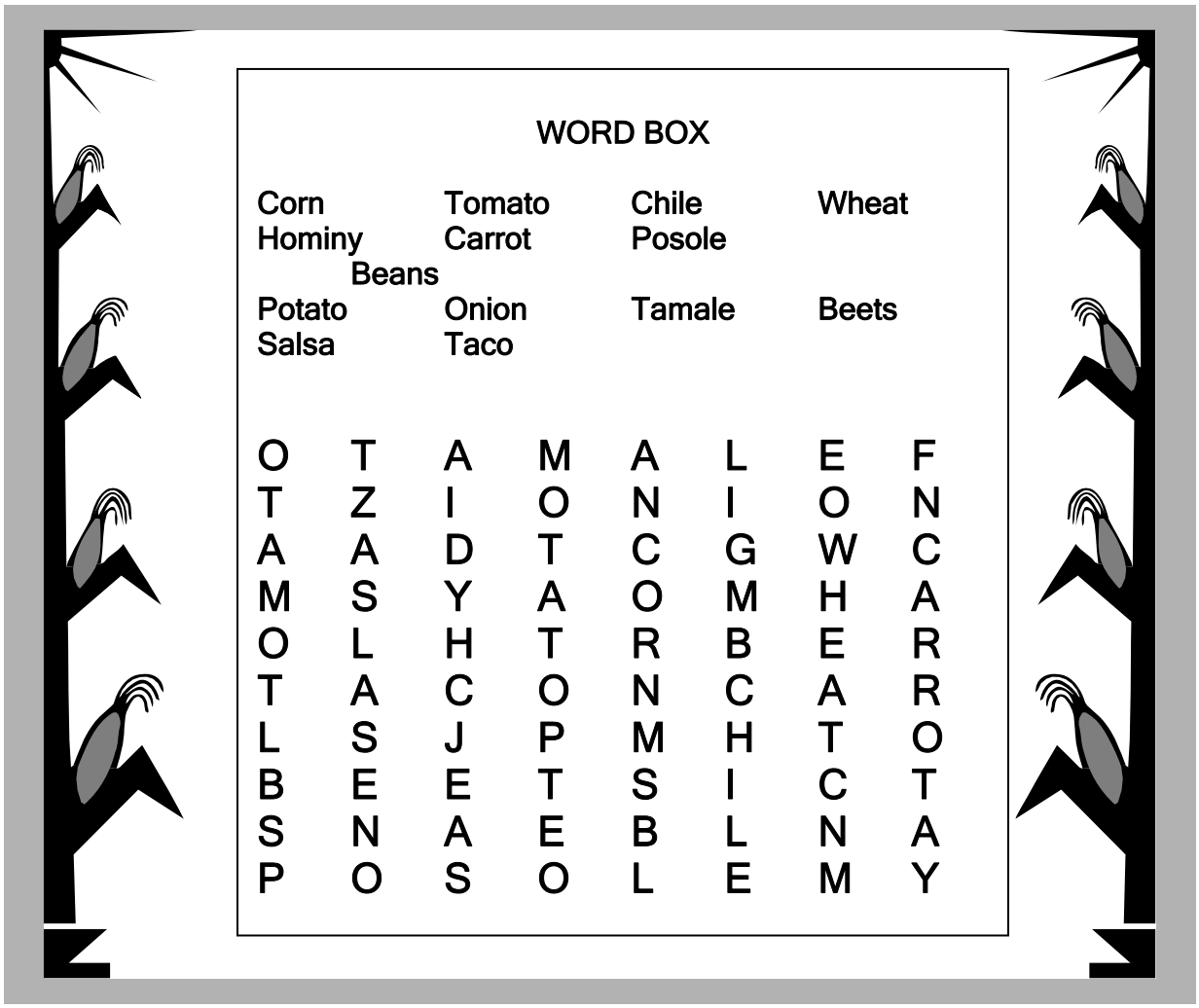
Wheat

Yams

Sunflowers

Tomatoes

Directions: Search for the words listed in the Word Box. Circle the words. Words may be diagonal, sideways, or backwards.



WORD BOX

Corn	Tomato	Chile	Wheat
Hominy	Carrot	Posole	
Beans			
Potato	Onion	Tamale	Beets
Salsa	Taco		

O	T	A	M	A	L	E	F
T	Z	I	O	N	I	O	N
A	A	D	T	C	G	W	C
M	S	Y	A	O	M	H	A
O	L	H	T	R	B	E	R
T	A	C	O	N	C	A	R
L	S	J	P	M	H	T	O
B	E	E	T	S	I	C	T
S	N	A	E	B	L	N	A
P	O	S	O	L	E	M	Y

Lesson Plan 5: Tapestry of Cultures

Celebrating Cultures

By Bernice Fiske and Vivian Arviso

New Mexico Standards

Social Studies, Civics and Government: III-B, 4.1

Learning Objectives

1. The student will identify the ethnic groups that lived in the Rio Grande Valley before the settlement of the City of Albuquerque.
2. The student will identify the ethnic groups that immigrated into Albuquerque after New Mexico became a U.S. Territory in 1850.
3. The student will gain an appreciation for the various cultures and their cultural contributions to Albuquerque.

Grade: 4th

Duration: 45 minutes

Setting: Classroom

Materials:

- Chalkboard and chalk
- Drawing materials
- Possibly a tape or CD player
- Paper and pencil
- Worksheet, *Everybody Belongs*

Background

Albuquerque was founded in 1706 on lands that previously had been settled by others. In its earliest days, this land was populated by Pueblo people. Today, only the Sandia Pueblo and the Isleta Pueblo remain.

As Albuquerque grew under the Spanish government (1598 to 1821), the Mexican government (l821-l846) and the United States government (1850 to present), its population became diverse.

People of African descent arrived with the earliest Spaniards. The first was the slave Estevan, who guided Coronado in 1540. Later, Buffalo Soldiers served in the Indian Wars and were assigned to forts in New Mexico. Before and after the Civil War, freed blacks and the end of slavery brought African-Americans to New Mexico.

As Albuquerque grew into a metropolitan city, people from European countries arrived who were Jewish, Greek, Irish, Italian, German, and French, among others. Many of these immigrants became bankers, store owners, car dealers, and prominent leaders in the community.

World War II and military research also had the effect of further diversifying the city's population. New jobs brought in new people with expertise from all over the world. Today, there are more than 27 ethnic groups in the city.

This lesson will encourage students to develop an awareness of the number of ethnic groups that are a part of this metropolitan area and the surrounding Pueblos. Students can appreciate these cultural contributions through seeing a culture's clothing, music, customs and art.

Set-up

A. Introduce this lesson through a review of people who lived in the Rio Grande Valley prior to its earliest occupation by the Spanish.
   1. Point out 19 Pueblos, the Navajo Nation, and the Jicarilla Apaches and Mescalero Apaches remain on distinct land areas in New Mexico.
   2. Identify Sandia Pueblo and Isleta Pueblo.

B. Discuss with students who arrived next in the Rio Grande Valley and built their homes along the river during the Spanish and Mexican periods.

C. Review with students the arrival of African-Americans and the immigration of European groups into the City of Albuquerque.

D. Inform students that they will identify different ethnic groups in the city.

E. Explain that students will draw or bring an item that's representative of a cultural group that they have chosen for this lesson. This item may be clothing, music, artwork or any other culturally significant piece that is representative of that culture.

Procedure

1. Use the chalkboard to review with students their identification of ethnic groups in the city and list them.
2. Point out that each person is shaped by their family as well as others living around them.
3. Explain that culture is the term used to describe everyone in a group of people who share the same behavior or way of life.
4. Review examples in which cultural differences exist, i.e. foods, shelters, clothing, music, language, etc.
5. Ask students to contribute their knowledge of how these ethnic groups would say "Good Morning or Good Day."

Spanish - Buenos Dias
Navajo - Yaateeh Abini
Isleta Pueblo – He Noo Ko pu um
Sandia Pueblo – He Noo Ko pu-um
French - Bon Jour
German - Guten Tag
Italian - Buon Giorno
Etc.

6. Distribute the worksheet, *Everyone Belongs*, and explain to students that this worksheet will help them with the assignment to select a cultural item to share with the rest of the class.
7. Allow students time to complete the worksheet, *Everyone Belongs*, and encourage students to write down the cultural group that they have chosen at the bottom of the page.
8. Tell students that they need to identify an item to draw or bring to class for a display of cultural items that are representative of this culture.
9. Encourage students who are unable to draw or bring an item to find a picture of the item in a book as their cultural item and give the date when the display will be held and its location.
10. On the given day, divide students into groups of three and have students discuss their cultural item. Each student will write a description of the item with an explanation of its use to be placed next to the item in the display.
11. Allow time after the display is completed for students to verbally report on their cultural item to the class.
12. Congratulate students on the completion of the work for this display.

Evaluation

Students may be assessed upon their completion of the worksheet, *Everybody Belongs*, and their written description and explanation of the use of their cultural item.

Extension

Encourage students to learn more about other cultures in New Mexico. Explain that culture shapes how we see the world, ourselves, and other people. Therefore, it is important to understand our own culture as well as that of other people.

EVERYONE BELONGS

Directions: Think about the ethnic groups in Albuquerque and choose one. Now, write down your answer to each question.

1. Name a holiday or celebration in this culture. 2. What music or instruments are used in this culture? 3. Name some foods.	4. Can you write down a word from the language in this culture? 5. What do people in this culture wear on special occasions? 6. Name a game played by children.
What is the name of this culture?	Name the cultural groups in the City of Albuquerque.

Resources

Books

Albuquerque Journal, *Albuquerque Tricentennial 1706-2006: The Official Guide*, Albuquerque Publishing Co. library at 823-3490.

Foster, Nelson and Cordell, Linda eds., (1997). *Chiles to Chocolate: Food the Americas Gave the World*. Tucson: University of Arizona Press.

Hunter, S.M. (1997). *Four Seasons of Corn: A Winnebago Tradition*, Minneapolis: Lerner Publications Co.

Miller, J. (1996). *American Indian Foods*. New York: Children's Press.

Videos

Colores Series. KNME-TV "Storytellers".
Rachel Agoya shares a Cochiti tale of a gossiping fly. Max Salazar tells of his personal experience with the Hispanic "La Llorona" and how he trapped a witch.

"Trickster Tales". Stories from various cultures including a Pueblo story about Coyote.

Web Sites

www.cabq.com
For an article on Cultural Diversity - www.cabq.com/s5cult.html.

www.Albuquerque300.org
The Tricentennial site has a great deal of easily accessible information.

www.nmcn.org or www.nmcn.org/heritage
New Mexico Culture Net website has lesson plans.

www.abqarts.org
Includes an Area Ethnic Events Calendar.

www.nmmagazine.com New Mexico magazine
Articles and scenic pictures of NM. Histories of Indian tribes with good pictures.

www.medicinemangallery.com
Commercial site with examples of Native American and Hispanic arts and crafts

www.zianet.com/wblase/courier/buffalo.htm
Short history on the buffalo soldiers.

www.horizon.nmsu.edu/garden/history
New Mexico State University Agriculture Department information about Old World and New World Foods.

Puddled Mud and Pueblo Revival
Architecture in Albuquerque

Over the past 300 years, the architecture of Albuquerque has evolved from one-story buildings of baked earth to soaring structures held fast by steel I-beams. In between came Spanish Colonial, Territorial, Pueblo Revival and a variety of architectural styles brought in when the railroads and highways linked Albuquerque with the rest of the world.

Pueblo Period

Early Pueblo people built small villages, mostly made from stone, in the Sandia foothills and Tijeras Canyon area during A.D. 1100-1200. Following a 13th-century drought in the Four Corners and Mogollon Mountains, the valley's native population increased dramatically. Numerous pueblo villages, many made of adobe and standing several stories high, were built on both sides of the Río Grande. Many villages had hundreds of rooms; the largest ones had over a thousand rooms and probably several thousand inhabitants. Villages included rectangular living and storage areas, ceremonial *kivas* which were rectangular and incorporated in blocks of living rooms, or separate, semi-subterranean, circular rooms; and plaza areas.

Rooms were constructed of either masonry or, closer to Albuquerque, "puddled" adobe built up in thin layers to form walls. Timber was cut from the cottonwood *bosque* or hauled from the Sandia Mountains for *vigas* and *latillas* used to support flat roofs. Women performed much of the labor to build and maintain the impressive structures, which towered more than three stories with terraces and rooftop entryways that deterred intruders.

Spanish Colonial and Mexican Periods

Homes of adobe were the norm well into the 1800s. The primary building style in New Mexico was a clean, rustic cubical form with adobe walls and flat roofs—a style mandated by local materials. Albuquerque's isolation created an evolution of Indian Pueblo building techniques with a Spanish influence.

Homes were small, one level and made of adobe. Over time, families enlarged their houses by adding rooms, and as additions were made, the house might take an L-shape or U-shape. Each room had its own entrance from the outside and inner doors were rare. Small windows were high on the wall and covered with hides or skins when the weather was bad. Floors were packed earth, often soaked with animal blood to control dust. Later on brick was also used for floors.

In the larger houses, rooms were built around a courtyard, or *placita*. At the back of the house was a corral. The whole complex was enclosed within high adobe walls with no windows or doors and only two sets of gates. The front gate opened to a *zaguán*, a covered passage wide enough to allow a wagon into the placita. The rear gate opened to the corral.

Sometimes several families built a line of rooms and connected them around a plaza to form a fortified community.

Adobes were an excellent material to use for home building because clay, sand, straw and sunlight were readily available. Using a wooden frame or mold that was open at the top and bottom, settlers produced adobes 18 inches by 10 inches by 5 inches. Then they removed the frames and left adobes on the ground to dry. They used stones for the foundation. Thick mud was used to bind the adobes to each other and to the foundation.

With the walls up, the roof was next. *Vigas* or beams were placed about 24 inches apart across the walls. They started by using the larger logs at one end and working down to the smaller ones. This was necessary to make sure that the water would flow off the flat roof. The ceiling was built by placing straight branches, called *latías*, across the beams. These were then overlaid with reeds and followed by a cap of several inches of dirt.

U.S. Territorial Period

With annexation and the arrival of Army personnel and other Americans, including settlers, miners and tradesmen, New Mexico came out of its isolation, and new influences could be seen. In addition, Indian raids began to abate and then stop in the 1880s.

When buildings no longer had to be small forts, home building changed. Gone was the plaza, replaced by the front porch. And two-story houses began to appear. Houses were no longer a string of rooms but several rooms deep and wide. Brick and wood were increasingly used, and the wooden floor replaced packed earth.

Greek revival architectural style, popular on the East Coast by the 1820s, was introduced several decades later in New Mexico. By combining the native Spanish Pueblo style with the Greek revival, the Territorial style was born. New Mexicans found that a brick cap protected an adobe wall and kept it from melting. To their adobe buildings they also added narrow windows at the sides of the entry doors, big casement windows, wooden moldings and Greek revival elements. But roofs remained flat.

When the Bishop Lamy arrived in 1851, he and his priests didn't care for New Mexico's mud churches or its traditional art. They razed some churches and built new brick, Gothic style churches in other towns. Albuquerque's San Felipe church was spared. It did get some wooden trim on the towers to create Gothic shapes.

With the coming of the railroad in 1880, newcomers arrived with their favorite architectural styles and by 1900, a whole range of styles appeared. It had taken decades for them to be introduced elsewhere, but with a diverse population, easy transportation of building materials, and knowledge of designs, these imported styles changed Albuquerque's built environment. Suddenly Albuquerque had sections of town that resembled the East or MidWest.

Long-time merchant Mariano Armijo was one who embraced the changes, when he decided it was time for Albuquerque to have its first elegant hotel. In 1882 he chose to build in New Town, which had sprouted along the railroad tracks, rather than on the plaza in Old Town. And he turned away from traditional adobe architecture to construct the three-story Armijo House with a distinctive Mansard roof. (The building, at Third and Railroad Avenue burned in 1897.)

Similarly, merchant Franz Huning in 1884 built a 14-room mansion of *terrones* (sod), a traditional material. But the Italian-style Castle Huning was faced with wooden paneling and painted to resemble brick. (Castle Huning, at Railroad Avenue and Fifteenth Street, was torn down in 1955.)

Much of the new building in New Town was of brownstone, mimicking styles popular in the east. As the 1900s approached, the Spanish Pueblo and Territorial styles were disappearing.

William G. Tight and Pueblo Revival

The tide began to turn when William G. Tight became president of UNM in 1901. The university's first buildings, University Hall (now Hodgin Hall) and Hadley Hall, were Richardson Romanesque structures of brick and sandstone – typical buildings for a Midwestern campus.

Tight, an easterner, was captivated by Pueblo architecture and culture. He frequently visited area pueblos with camera and sketchpad and began to incubate his concept for a distinctive type of architecture for the university. Local buildings, he said, should reflect local culture. Albuquerque architect Edward Buxton Christy provided him with drawings, and he launched his campaign to make UNM "the pueblo on the mesa."

Tight and his students built the first structure, a power plant, of adobe. Tight also supervised the first dormitories for men and women – also in Pueblo style with vigas, woodwork decorated in Indian symbols and corner fireplaces.

On the east side of campus he built an *estufa*, a replica of the kiva at Santo Domingo Pueblo. Next Tight determined to "pueblo-ize" University and Hadley halls. Workers removed the steep roof and the fourth floor of Hodgin, along with gables, cornices and chimneys. The buildings gained vigas, pillars and balconies. Stucco covered the brick.

Faculty and students liked the new look, but Albuquerque residents didn't. Some called it a "reversion to the primitive." The public uproar prompted the Board of Regents to find an excuse to fire him in 1909. Tight died a few months later and didn't see his ideas flower.

In the early 1900s the railroad started constructing its own buildings in Pueblo style. About this time, Albuquerqueans began to realize that part of the ambience attractive to visitors was the experience of a unique architectural environment. If the trend of importing styles continued, New Mexico would have nothing to offer. So the traditional architectural styles were revisited.

In 1927 the UNM Board of Regents formally adopted the Pueblo architectural style for campus buildings. In 1933 John Gaw Meem, a prominent supporter of Pueblo style, became university architect.

Meem melded these styles and brought them into the 20th century with his Pueblo Revival style, which employed vigas, rounded corners, and multiple stories with sloped or terraced walls. He designed 30 structures on UNM's campus. Two notable ones in the 1930s, the Administration Building (Scholes Hall) and Zimmerman Library, were funded through WPA sources. This solidified the campus as one with an immediate sense of place and featured award-winning buildings and landscape designs.

The Birth of Pueblo Deco

This popularity of Spanish-Pueblo design carried over to the community. Numbers of commercial buildings maintained the trend. The KiMo Theatre, built in 1927, was designed by Hollywood architect Carl Boller, in Pueblo Deco style, which embraced the

old and the new and added Indian designs. It was one of the nation's first theaters with a cantilevered balcony, which didn't require view-blocking support beams.

The Hotel Franciscan in 1923, designed by Trost & Trost of El Paso, had a number of Spanish and Pueblo features, including an eight-story central room block set back from the street above the first floor and flanked by three, four-story towers. It also featured concrete vigas, *canales*, simulated adobe walls, a portal with wooden posts, and corbels. The concrete was finished to look like adobe. Interior furnishings were also Southwestern. It was the first major, downtown building to employ Southwestern design to appeal to visitors.

In 1926 the school district demolished the three-story brick Victorian school building at Central and Edith and erected a new Pueblo Revival public library, which survives. (City workmen used the brick to build a fire station.) In 1932 the federal government built the $1.25 million Veterans' Administration hospital complex of 16 buildings on the Southeast Mesa in Pueblo style.

Other Pueblo Deco buildings remaining from the 1930s are the Maisel Building at 510 Central SW (the exterior was designed by John Gaw Meem) and the Albuquerque Indian Hospital near the UNM Medical Center on Lomas, designed by Hans Stamm.

A Variety of Styles

Other buildings reflected outside influences.

The Alvarado Hotel, completed in 1902, was the finest railroad hotel of its time. Charles F. Whittlesey designed the California Mission-style building, which featured towers, balconies, and arcades supported by arches. It had 75 rooms, parlors, a barbershop, a club, a reading room and a Harvey dining room. It also offered electricity and steam heat, luxuries at the time. Whittlesey's mark is on a number of railroad hotels, but he's probably best known for designing El Tovar at the Grand Canyon.

The Hudson Hotel, built in 1905 at 202 Central NE, was a Romanesque style structure, with massive brick scale, round arches, and molding on the gables. It's the last remaining hotel of the railroad period. In 1908 the federal government built in Renaissance Revival style the former post office at Fourth and Gold. In 1910 the Rosenwald building, a department store, was the first fireproof, reinforced concrete building in state.

In 1914 the old Albuquerque High School at Central and Broadway was built in Gothic style, with arched doors and bay windows. Another distinctive building that still stands is the 1917 Occidental Life Insurance Co. building at Third and Gold, modeled on the Doge's Palace in Venice. It's a masonry building faced with white tile. The architects were Trost & Trost of El Paso, who designed many of Albuquerque's commercial buildings in those years.

Albuquerque got its first two skyscrapers in the early 1920s, both designed in Renaissance style by Trost & Trost. The first was the nine-story First National Bank building at Central and Third Street, built in 1922 by the pioneer banking Raynolds family. It featured tall, arched windows on the first floor and decorative details. Leading physicians, dentists, law firms and insurance agencies all wanted space in the building.

In 1923 the six-story Sunshine Building went up at Second and Central. It was Albuquerque's first big theater and boasted an ornate marble lobby.

In 1930 the federal government built a second building next to the downtown post office. It was a six-story courthouse and office building, which indicated the government's increasing presence in the city.

Modern Architecture

When the Depression struck, after the Stock Market Crash of 1929, commercial building in Albuquerque ground to a halt. In the 1930s an infusion of federal relief money would fuel construction of numerous buildings at UNM, as well as the State Fairgrounds and the first municipal airport – all in Pueblo style.

After the war, driven by the city's vigorous growth, commercial building began again, but now one aim was to accommodate the ubiquitous automobile. Route 66 was busy, and motels and diners, many in the period's Deco style, popped up along Fourth and Bridge streets, the early alignment of Route 66, and then Central.

In 1949 R.B. Waggoman completed the Nob Hill Business Center, which was the city's first shopping center. Farther east on Central the Highland Shopping Center bloomed in 1951, with the Hiland Theater. Way out on the East Mesa Hoffmantown Shopping Center also took shape in 1951.

Old Town, over its long life, had remained a quiet and separate village of adobe and Victorian homes. It wasn't incorporated into Albuquerque until 1949. At that time it was becoming a tourist magnet. To meet visitors' expectations of an old adobe village, merchants altered facades, added second stories, and built new buildings. Victorian buildings disappeared behind pueblo facades.

While old-fashioned (or the appearance of old-fashioned) charm was suitable for Old Town, it wasn't for the rest of Albuquerque. Like the rest of post-war America, Albuquerque strived for modernity.

That's why boosters didn't shed a tear in 1953 when the handsome, brownstone Albuquerque Commercial Club, the forerunner of the Chamber of Commerce, was razed to build the 13-story Simms Building. It then became the city's tallest skyscraper and the first in the modern International style of architecture, which valued simplicity over ornamentation. This style would be replicated in hundreds of buildings in the 1950s and 1960s. However, in a salute to the old, Simms builders incorporated one wall of the old club. The architect was Max Flatow.

In 1959 the wonderful old Pueblo style Wright's Trading Post was leveled to build the Bank of New Mexico Building. In quick succession more tall buildings joined the city's growing skyline, each vying to be tallest. At San Mateo and Central the 17-story First National Bank Building became the city's tallest in 1963. In 1966 the 18-story National Building (now the Compass Bank Building), at Fifth and Marquette became the tallest. In the same period, the Bank Securities Building at Lomas and Second (now the Wells Fargo Building) and the 13-story federal building were also built.

Photographers complained that the city's skyline was changing so rapidly that their pictures became outdated in months.

At the same time, shopping centers exploded in Albuquerque. It was convenient to the new neighborhoods growing quickly in outlying areas, but it was the beginning of the end for downtown retail.

In 1961, Winrock Shopping Center opened. UNM president Tom Popejoy had convinced financier Winthrop Rockefeller to lease university property in the Northeast

Heights. Rockefeller called his project the first “regional shopping center.” That year Dale Bellamah built the Northdale Shopping Center in the North Valley and the Eastdale Shopping Center in the Northeast Heights, and Elmer Sproul built Indian Plaza at Indian School and Carlisle. It gained its trademark arrow because Sproul’s logo was an arrow.

Coronado Shopping Center followed in 1965, built by Sears subsidiary Homart Development.

By the early 1960s, the old airport terminal building was too small, so the city built a new one, which opened in 1963 and has since been expanded and upgraded several times. The Albuquerque International Sunport evokes New Mexico by the building design, decorative elements, and the beautiful artwork collection. This commitment to a Southwestern design provides a sense of identity to a commercial and institutional space that visitors admire and that locals appreciate returning to after their journeys.

In 1966 UNM built University Arena, better known as The Pit, with a seating capacity of 15,000 fans. In 1975 the university added a mezzanine, expanding space for 18,000. Known for its efficient use of space and design, which makes the crowd a part of the event, it’s one of the top 25 sports venues in the country.

This was a period of firsts, as modern architecture made its mark. Unfortunately, it also saw the wrecking ball that characterized Urban Renewal, which destroyed many of the city’s best known landmarks in the name of modernism. The 1970s opened with the demolition of Albuquerque’s architectural jewel, the Alvarado Hotel, after historic preservationists failed to sway the Santa Fe Railway. And Hodgin Hall was nearly lost a year later to construction of a loop road.

New construction continued: The Convention Center in 1972, the airport terminal addition in 1973, Civic Plaza in 1974, and the Albuquerque Public Library in 1975. But the loss of the Alvarado and other city landmarks produced enough public alarm and, possibly, guilt to launch a spate of restorations. The first major historic renovation downtown was the vintage 1910 Rosenwald building by architect Van Gilbert.

In quick succession architect Harvey Hoshour directed the 1982 restoration of the KiMo Theatre after much public debate, along with restoration of the Occidental Life Insurance Building. Flatow, Moore, Bryan & Associates restored the First National Bank Building, and Boehning, Protz, Cook & Associates restored the Sunshine Building.

In the 1980s more buildings joined the downtown skyline: The First Plaza complex on Second St., PNM’s Alvarado Square, the 11-story city-county building, the 15-story Marquette Building, and the Sunwest Bank Building. Construction began in January 1988 on Albuquerque Plaza, a 22- story office tower and neighboring 20-story Hyatt Regency Hotel. The office tower is now the tallest building in New Mexico.

In the cultural arena, the last ten years have seen the creation of the Albuquerque Biopark and Aquarium, the National Hispanic Cultural Center, the Anderson-Abruzzo Balloon Museum, and Explora Science Center and Children’s Museum. The city completed major expansions and renovations of Tingley Beach, the Albuquerque Museum of Art and History, the Atomic Museum, and the baseball stadium.

The architectural community is well represented with a thriving American Institute of Architects chapter, The Albuquerque Conservation Association (TACA) and the New Mexico Architectural Foundation.

Albuquerque also has the distinction of being home to such internationally renowned architects as Bart Prince and Antoine Predock.

Resources:

Albuquerque's Environmental Story: http://www.cabq.gov/aes/

Bunting, Bainbridge. Early Architecture in New Mexico.

Fitzpatrick, George and Caplin, Harvey. Albuquerque: 100 Years in Pictures, 1875-1975.

Simmons, Marc. Albuquerque: A Narrative History.

Lesson Plan 1: Architecture

Three Architectural Styles of Early Albuquerque

Plans by Bernice Fiske

New Mexico Standards:
Social Studies, History: I-C: 4.1
Geography: II-A:4.2; II-C: 4.1,4.2; II-E: 4.3
Art C.S. 1: V.A.,A.2; 2: V.A, A.1,A.2
Language Arts: I-A: 4.4; I-B: 4.2; I-D: 4.5; II-A: 4.1

Objectives: The students will use pictures to identify characteristics of the Victorian cottage, Pueblo, and California Spanish architectural styles. They will contribute ideas in both large and small group settings. Students will use pictures to categorize buildings as Victorian cottage, Pueblo, or California Spanish architectural styles. They will utilize Web sites to view examples of styles.

Setting: Classroom

Duration: Two class sessions

Activity 1

Background

Albuquerque's early ethnic groups contributed several styles of architecture to the growing city. Add on those that reflected the many changing styles over 300 years, and you'll find a wide variety. This unit will present three styles: Pueblo, one from the Victorian era, and California Spanish. They were selected for their popularity in Albuquerque and for their easy-to-distinguish characteristics.

The first buildings were Pueblo style – walls of adobe bricks covered with stucco and flat roofs with vigas. Those built in later times with modifications like stylized shapes are called Pueblo Revival. A few buildings like the KiMo blended the Art Deco movement with the more traditional in a decorative mix called Pueblo Deco. The Pueblo style continues to be popular, with new variations in shapes like the Indian Pueblo Cultural Center's building.

Victorian cottages were built of exposed wood, stone, or brick (little or no stucco), had pitched roofs, and often had wooden porches with spindles and gingerbread decor. They were built from the 1890s to 1920s. View these in the older areas of town: Downtown (north of Central, east and west of 12th St.) and the Huning Highland area (near the old Albuquerque High School, north and south of Central, east of Broadway on Arno, Edith, and Walter).

California Spanish may be constructed of any building material and is covered in stucco. It is characterized by a low-pitched, red-tile roof and occasional decorative wrought iron. If two-storied, it may have balconies. (The Mediterranean style is similar, but with more decorative touches in roof style, plaster, etc.) Variations on this graceful style are still being constructed. Examples are in many areas of Albuquerque, including the Old Country Club area.

Materials:

- Set C (characteristics) pictures, enough copies for each small group to have a set
- *Style Characteristics* worksheets for each student

Vocabulary

architecture - art or science of designing buildings; building styles

adobe - bricks made of clay, mud and straw, baked in the sun

stucco - plaster used on the outside of buildings, in modern times usually mixed with cement

vigas - originally heavy tree branches or trunks used for roof supports, now rounded, wooden sections

pitched roof - a raised roof that forms angles to the building

spindles - long, slender, shaped pieces of wood

gingerbread - decorative, flat, scroll saw cutouts

Setup: Tell the students that many styles of houses have been built over the years. Ask them to identify the styles of their own, if they can. Tell them they are going to learn to identify three styles.

Procedure:

1. Give each student a *Style Characteristics* worksheet.
2. Divide them into small groups and give each group the "Set C" pictures. Have the total group read the style names across the top of the worksheets -- "Pueblo,". "Victorian Cottages," and "California Spanish" -- and note that the Set C pictures have either the letter P, VC, or CS written on them.
3. Tell them that as a group they are to find at least two things about each style that makes it special.
4. Each person is to write those characteristics in the correct column.
5. After students have completed the task, discuss with the total group the characteristics they have listed. Write on a chart or on the board. Provide them with information in areas they may be unaware, such as type of construction. Students need to complete the lists on their own worksheets, which will be used in Session II.

Assessment: Did students identify differences in the styles? Did each one contribute in both large and small group settings?

Activity 2

Materials:

- Style pictures Set I (identification), enough copies for individuals to pass around and share
- *Identifying Styles* worksheets for each student. (You may want to cut pictures apart, mount and laminate them.)

Setup: Review results of the previous session on the Style Characteristics worksheet. They will use this for reference as they do the activity.

Procedure: Individually or in pairs, students will use the Style pictures, Set I (identification) to identify the house styles by writing the picture number in the correct column on the *Identifying Styles* worksheets. Notice the fourth column, "Other," for obviously different styles.

Assessment: Did the worksheet indicate students were able to apply the characteristics to differentiate the styles?

Follow up: Bookmark: www.cabq.gov/film/gallery/neighborhoods.html. (From there students may also select "Urban Scenes and Architecture.") Have students view pictures individually or in pairs to find examples of architecture discussed in lesson.

Lesson Plan 2: Architecture
Map Reading

New Mexico Standards:
Social Studies, Geography: II-A: 4.1, 4.2; II-C: 4.3

Objectives: The students will cooperate in reading a map to locate notable downtown Albuquerque buildings. They will utilize an interactive map site on the Web to locate historic buildings.

Setting: Classroom

Duration: 45 min. map activity plus computer time

Preparation: Bookmark: www.cabq.gov/planning/lucc/landmarks.html

Materials:
Map Hunt worksheets for each student
Maps, enough copies for partners
M (map) pictures as needed to pass around and share. (You might want to laminate "M" pictures.)

Setup: Discussion on Old Town as the original Albuquerque with Downtown added on with the coming of the railroad. Today Old Town is important as an historic area. It also has many interesting shops for both Albuquerqueans and tourists. Downtown is now an important district for government and businesses. Find out how many of the students can name some Old Town and Downtown streets.

Activity 1

Procedure: Give pairs of students a copy of the Downtown map and tell them they will use it to find some special places. Point out that there are circled numbers on the map. Ask how many have used maps before. Remind them that the top of the map is almost always north. Let them complete the compass with the other directions.

Have students refer to the Downtown map to see that:
1. The north-south streets are numbers, which start at the railroad tracks and get larger as you go west. (First, Second, etc.)
2. The addresses of the buildings on these streets start at Central Ave. There is a 100 block north of Central and a 100 block south of Central. The numbers get larger as you move away from Central in either direction.
3. Other streets run parallel (in the same direction) as Central: east-west. South of Central Ave. are Gold Ave. and Silver Ave. Have students note they are metals. North is Copper Ave. (also a metal), Tijeras Ave., Marquette Ave., Roma Ave., Fruit Ave., and Lomas Blvd.

4. Explain that address numbers start at the railroad tracks and get larger as you move to the west. Similarly, the street names, which cross numbered streets, get larger as you move north and south from Central. The north-south street names can help you find the addresses since the 100 block of Central is between First and Second Streets.

When you are satisfied the students understand basic map reading well enough to work with a partner, pass out the "Map Reading" worksheets and show the pictures. The pictures have the name of a building and its address. They are to locate the address on the map and find the circled number. On their worksheets they will write the numbers next to the names of the buildings. The buildings are not listed in order. The first building is not #1. Distribute the pictures and provide assistance as needed.

Evaluation: Were students able to locate the buildings? Did they cooperate with their partners?

Activity 2

Procedure:

1. Bookmark: www.cabq.gov/planning/lucc/landmarks.html. The site's use will depend on the availability of computers and the user level of your students. Have students explore the interactive Web site to see and read about historic landmarks. Since the text is lengthy, you may direct them to select one or two they would like to read. Depending on the group or individuals, you might ask them to take a few notes on those selections, including names, addresses, dates, what they were used for, etc.
2. Students are to find the one that is not a building and to identify one they would like to visit. (Caution: Tell students not to close the Web site until they are through, or it will have to be reloaded. After their first window, direct them to click on "Historic Landmarks" on the left side of the screen to continue using the map for locations. They can just click on the list at the bottom, but this won't give them map experience.)

Evaluation: Were the students able to identify the non-building site and describe another to visit? How well were the students able to navigate the site?

Extension: Utilize other Web sites from the Resources list.

Lesson Plan 3: Architecture
Construction and Design

New Mexico Standards:
Language Arts: I-A: 4.4; I-B: 4.2; I-D: 4.5, II-A: 4.1
Math, Geo. data 4.1
Visual Arts Con. St.: 1- A.1, A.2; C.S. 2-A.1: C.S. 5-B.2, C-1

Objectives: The students will differentiate between statements of fact and opinion. They will acknowledge that some choices are personal preferences and not right or wrong. They will compare and contrast older and more recent building construction and styles. Students will utilize problem-solving strategies to decide on criteria for evaluating the desirability of various building construction and styles. They will draw the facade of a house to demonstrate the result of their personal evaluations. They will write criteria used to make the drawing.

Setting: Classroom

Duration: Two class periods

Activity 1
Identifying Criteria for Houses

Setup: Before class, give students time to look through the books on houses. Tell students you are going to be asking what they think about different kinds of houses. Help them clarify that some things might be based on fact. For example, the Little Pigs' brick house was more windproof than the straw house. Some may be their own personal choice, like what color it is. Have students complete the following: "One thing I really like about some houses is . . ." and "One thing I really don't like about some houses is . . ." After each have the class identify whether the statement was based on a fact or was an opinion.

Procedure:

1. Have a short discussion on why we have houses. Narrow it down to basics like: safety and protection for people and their property, comfort and shelter from the weather, and personal enjoyment. Use the board as the criteria are developed, while students write on their own papers.
2. Ask what main things about houses help provide shelter, comfort, etc. On the board, model making a chart by drawing lines for columns and labeling them with their suggestions so you end up with something like:

Construction	Roof style & material	Other features
adobe	high pitched, tin	picture windows
wood frame	low pitched, shingles	fireplaces
etc.	etc.	etc.

3. As your criteria chart is developed, ask for comments about the good and bad aspects of each, based on fact. For example, adobe provides good insulation, holding in the heat in winter but is expensive; frame houses are easier to build in a variety of shapes and can be well insulated, but are not as safe from fire. The knowledge level of your group will determine how detailed the chart will be. You may need to provide some information.

Assessment: Were students informed on basic house construction and features? Did they go beyond things learned in studying the first three basic styles presented? Did they show respect for each other's contributions?

Activity 2
My Dream House

Materials:

- Picture books of architectural styles
- Art paper
- Rulers
- Pencils
- Optional: crayons, colored pencils or paints

Setup: Read the following poem.

Unlike Three Pig City, we have no wolves for foes.
We do have coyotes who might nibble your toes.
He can't blow your house down, but a coyote is sly.
To get in your home he surely will try.

Slipping slowly and softly . . .
A clever coyote can climb in your casa.
Better block the beast from your building.

Draw a design to defend your dwelling.
Keep the creepy creature away.

Tell students their assignment is to draw the front view of a house they would really like to have -- a "Dream House." They may use samples of buildings they have studied or seen or just make up themselves. Encourage the use of rulers. You might want them to color it and add some landscaping.

After they have finished, on a separate piece of paper they are to tell:

1) A few practical and factual things about their houses like what it is made of, roof type, windows, etc.
2) Personal choices they made just because they liked them, such as the style they chose, special rooms or features.

Display their pictures and have them share their ideas.

Evaluation: Look for synthesis. Did the students take information they had learned and transform it into something unique to them? Were students accepting of one another's ideas?

Extension (Math): Students draw a basic floor plan of their houses.

Resources

Pamphlets:

Albuquerque Convention & Visitors Bureau located at the Sunport Baggage Claim area, the East Convention Center and Old Town. *Dozens of maps, pamphlets, magazines which are colorful, interesting, informative and free!*

Books:

Johnson, Byron A. (ed.) with Dauner, Robert K. (photo.). Early Albuquerque. Albuquerque: Journal Publishing Co., 1981.
A wealth of scenes from long ago of people and structures.

Greater Albuquerque Chamber of Commerce. Albuquerque -- Spirit of the New West. Albuquerque: Starlight Publishing Co., 2000.
A colorful collection of twentieth century photographs.

Motto, Sytha. Old Houses of New Mexico and the People Who Built Them. Albuquerque: Calvin Horn Publisher, Inc., 1972.
An historical treasure, which delves into the biographies of notable citizens and details of their houses.

Videos:

KNME-TV Colores Series: (available at public libraries)

John Gaw Meem (15 min.)
Views of the University of New Mexico. Excellent examples of the Pueblo Revival style by the architect who developed it. Discussion of the work by other architects may be difficult for some fourth graders.

Bart Prince: In the Cause of Imagination (30 min.)
Tour of Prince's unusual house in Albuquerque and his other buildings would likely intrigue most students. The monologue by Prince may be difficult for some fourth graders, but they'll likely be too fascinated to care.

Mi Casa (30 min.)
Provides examples of various building techniques: traditional (Carmen Velarde who builds adobe fireplaces) and innovative (Michael Reynolds of Taos who built his "Earthship" out of tires, cans and adobe).

Web Sites:

Needed for activities:
www.cabq.gov/planning/lucc/landmarks.html
www.cabq.gov/film/gallery/neighborhoods.html

www.cabq.gov/a-z.html
The City of Albuquerque has many photographic sites. Scroll through list for Culture, Historical Landmarks, Environment, Museums, Old Town, KiMo, Geography or go to Home Page and search "gallery".

www.itsatrip.org/visitors/plazatour
Historic Albuquerque Plaza to Plaza Walking Tour starts at Civic Plaza and displays pictures of houses and other sights. It ends at the Old Town Plaza.

Architecture

Name_____

Date_____

Map Hunt

Use with the numbered map of Downtown Albuquerque and set of “M” pictures. Read the place and address on each picture. Find it on the map. There will be a number to mark its spot. On this paper write the number next to its name.

Place

___ Old Albuquerque High School

___ Bernalillo County Courthouse

___ Civic Plaza

___ KiMo Theater

___ Occidental Building

___ Pete Domenici Federal Courthouse

___ Plaza Building Statues

___ Railroad Station

___ Sunshine Building

Racing Firemen to Lobomania
History of Sports in Albuquerque

From the beginning, there was running. The area's Indian tribes relied on runners to carry news from group to group. Runners not only had to be strong and fleet, they had to accurately relay information – the group's safety might depend on it. Footraces were also popular as sporting events.

Running is still important here, but the city has also produced notable athletes in many sports.

Racing

When Spaniards colonized New Mexico and brought horses with them, the first horse race probably occurred soon after. Horse racing was well enough established that when a handful of prominent Albuquerque businessmen organized the first Territorial Fair near Old Town in 1881, the first structure they built was a racetrack and grandstand. (Exhibits were housed in tents.) The racetrack offered sulky, horse, burro, mule and foot races.

The crowd had plenty to watch. As races continued, the Albuquerque Browns played baseball in the oval inside the track. Betting was heavy on both races and baseball. In its second year the fair included a four-mile foot race by Zuni runners. Other events were horse and harness racing, bicycle and burro racing. A 1908 photograph of the Indian Marathon shows runners in bare feet or moccasins.

In 1917 the fair succumbed to financial pressures, but local boosters revived the fair in the 1930s. In 1935 the Legislature passed a measure that allowed tracks to keep a portion of racing bets. It wasn't aimed at the fair, exactly, but it provided a needed source of revenue. When Gov. Clyde Tingley secured funding from the federal Works Progress Administration, one of the first developments at the new site was a one-mile track, grandstand, racing office and jockey room. The fair reopened in 1938.

New Mexico was then the only state with pari-mutuel racing, and 5,000 fans packed the grandstand the first day. Horsemen – some from as far away as Montana – filled the adobe stalls. There were harness and steeplechase races, trotters and pacers.

That year the fair refused to register two women jockeys, Harriet Coneel and Helen Currier. Two other female riders, Wanda Banks and Alma Lloyd, had obtained their racing licenses from another track before the fair. Banks and Lloyd were two of the best riders ever to race in New Mexico and were so popular with fans that fair officials built a female dressing area for them the next year.

After the war, fair racing became the biggest such event in the Rocky Mountain region. One event, the New Mexico State Fair Futurity is the oldest continuously run American Quarter Horse stakes race. This contest between New Mexico-bred American Quarter Horses has been run at the fairgrounds since 1946.

Horse racing declined in the last few decades, but it's revived with The Downs at Albuquerque, which offers thoroughbred and quarter horse racing at the State Fairgrounds.

Athletic Firemen

Another sport in the 1880s and 1890s was the endurance contest between companies of volunteer firemen. In those days, firemen, and not horses, pulled the fire cart. The first men to respond to a fire bell began towing it toward the fire; others dashed through the streets and took their places inside a harness. As the men and their cart gained speed, the slower runners released their harnesses and got out of the way.

At the early state fairs firemen competed in such events as coupling team trials, wet and dry hose tests and hose cart and foot races. These events became so popular, they drew contestants from Arizona. Betting could reach $15,000 on an event, and the outcome was a matter of civic pride.

The National Pastime

In 1880, W.T. McCreight, a former player with the St. Louis Browns, organized Albuquerque's first baseball team. He also organized a training club of boys called McCreight's Colts. McCreight was foreman of the Albuquerque Publishing Co.

Because baseball season was finished in the East when the Territorial Fair opened, major league players could be recruited for $100 plus expenses. Sometimes they formed a team to play exhibition games against the Browns, and sometimes they joined the Browns for games against rival towns. Albuquerque's arch rival then was San Marcial, near Socorro. In 1894 the San Marcial team lost its game and its bets and had to walk home.

The first Albuquerque Dukes played in 1915. In 1931 the Albuquerque Dons became the city's first professional team. During the Depression, Gov. Clyde Tingley secured federal WPA funding to build bleachers and a 4,000-seat concrete grandstand at the ballpark at 10th and Atlantic in the Barelas Neighborhood.

When it opened in 1937, Branch Rickey, general manager of the St. Louis Cardinals, had high praise for Tingley and the Works Progress Administration. The Albuquerque Cardinals then lost an exhibition game to the visiting Pittsburgh Pirates. In 1938 the park was named Tingley Field.

Tingley Field had a capacity of 3,000 seats, but often 5,000 fans overflowed the stadium. When the batter hit a home run, he strolled along the bleachers, and fans handed him money.

The Albuquerque Cardinals were a farm club to the St. Louis Cardinals from 1937 to 1941. During World War II Tingley Field closed from 1942 until 1946. Baseball fans were entertained by semi-pro clubs and Kirtland's Flying Kellys, which included major and minor league players.

In 1945 the team was sold and joined the West Texas-New Mexico League, playing as the Albuquerque Dukes until 1958. In 1954 a local pitcher joined the team for a time: Pete Domenici.

Baseball's popularity waned in Albuquerque in the early 1950s, and "Save the Dukes" became a slogan by 1954. A local group bought the team, and they continued to play ball, but they were losing money. Farmington oilman Tom Bolack assumed the team's debts in 1956. Bolack negotiated a working arrangement with the Cincinnati Reds in 1958, then the Kansas City Athletics in 1960. In 1963 the Los Angeles Dodgers bought the franchise from Bolack, and the team became a Triple-A club. They were renamed the Albuquerque Dodgers in 1965.

Baseball continued in Tingley Field until 1968 when the existing stadium first opened.

Robert Lozinak bought the team from the Dodgers in 1979 and sold it in March 2000 to a group in Portland, Ore. The Dukes departed for good.

Bereft of their team and convinced they needed a better stadium to lure a new team, Albuquerque voters in May 2001 approved general obligation bonds to upgrade the stadium. Businessmen Ken Young and Mike Koldyke acquired the Calgary Cannons and moved them to Albuquerque, then signed an agreement with the Florida Marlins.

In 2004 Triple-A baseball returned with completion of an 18-month, $28.8 million renovation of the stadium. Inspired by an episode of "The Simpsons," team owners chose to call their team the Isotopes. The new Isotopes Park has a capacity of 13,000, up from 7,500 previously and is one of the finest stadiums in the Pacific Coast League.

The Best of the Best

Owen Smaulding, who moved to Albuquerque from Clayton, N.M., was named the most outstanding athlete in the United States in 1915. He participated in track, football, tennis, baseball and race-car driving. In 1937 he managed a team called the Collegians and later the St. Louis Blues, playing in the Negro Baseball League. He alternated pitching with Satchel Page.

Car Racing

Albuquerque's first speed limit in 1908 was 8 miles an hour. That didn't keep automobile enthusiasts from finding out who had the fastest vehicle.

In 1916 the state's first distance car race took place. The Albuquerque Automobile Racing Association staged a race from Albuquerque to Gallup over a segment of the National Old Trails system, the forerunner of Route 66. It normally took 13 hours to drive from Albuquerque to Gallup. In that race Lloyd Cunningham, driving a Maxwell, won in six hours, 53 minutes.

Albuquerque would gain a high profile in car racing from the Unser family, who in the 1940s operated a wrecking service at their Unser Garage on 7700 Central SW. Since 1964, either Al Unser, brother Bobby or Al Jr. has been in every Indianapolis 500 except one. Al won four races, Bobby won three, and Al Jr. won two.

The Unsers have opened their Unser Racing Museum in the North Valley, which features 28 of their race cars, plus other memorabilia the family has collected and items from other racers.

Lobo Football

UNM started its football program in 1892, three years after the school was founded. Back then the team was called the University Boys. They lost their first game on Oct. 7 to Albuquerque High School by a score of 5-0.

In 1920 a UNM student journalist named George S. Bryan suggested "Lobo" (Spanish for "wolf") as UNM's mascot. "The Lobo is respected for his cunning, feared for his prowess, and is the leader of the pack," he wrote in an editorial in the Oct. 1, 1920, issue of the UNM student newspaper.

That was the same year Coach Roy Johnson arrived at UNM. Johnson was a shot in the arm to an otherwise lackluster athletic program. From then until 1959, he coached football, basketball and track, and his teams were winners. For his huge impact Johnson Gym, built in 1957, was named for him. In 1958 the first eight black football players joined the team.

UNM has produced two football stars: Halfback Don Perkins, later with the Dallas Cowboys, who played during a winning seven-season stretch (1958-64); and Brian Urlacher, with the Chicago Bears.

Lobo Basketball

University basketball players had posted years of losses through the 1940s and 1950s. Lobo Basketball as we know it today didn't begin until Bob King arrived in 1962 from Iowa. King brought a 6-foot-81/2-inch player named Ira Harge, who would become one of the university's greatest athletes.

King quickly turned the team around, and fans noticed. Tepid crowds of a few hundred quickly grew to thousands and began filling Johnson Gym. In 1966 UNM built University Arena, fondly known as The Pit, saving money by hollowing an arena out of the ground instead of erecting it above ground, and 7,000 fans became 15,000 fans. Screaming, barking, howling fans. Lobomania was born. In 1975 the university added a mezzanine, expanding space for 18,000. And the fans are still wild.

Bob King died in 2004 and was eulogized as the architect of Lobo basketball.

Lady Lobos had an equally modest beginning. Before New Mexico was a state, UNM women had two basketball teams – the Olympians and Gladiators. They played in knee-length bloomers, heavy stockings and big collars with bows.

In the 1970s, thanks to Title IX, women's sports began in earnest at UNM. From the 1990s on, women's basketball, under the guidance of coach Don Flanagan, took off and has been nationally ranked in attendance for years.

Boxing

Boxing has long been part of the city's sports scene. In 1897 the first movie shown in Albuquerque was of a fight between boxers Bob Fitzsimmons and James Corbett for the world championship.

Fighter Bobbie Foster had a training gym in Albuquerque. He won the world light heavyweight title in 1968 and kept it until he retired in 1974 with 56 wins, eight losses and one tie. In his time he took on such daunting opponents as Joe Frazier and Muhammad Ali. When he wasn't boxing, Foster was a Bernalillo County deputy sheriff. For his weight, he was one of the deadliest punchers in history.

In recent years, Johnny Tapia is a five-time world champion. Danny Romero is a three-time world champion.

Skiing

Albuquerque's first skier was probably Charlotte Ellis, who in 1896 strapped on a pair of skis crafted by her brother and set out in the Sandias, where her father established a homestead.

The father of skiing as we know it was Bob Nordhaus. Growing up in Albuquerque, Nordhaus had already spent time in the mountains, but as a Yale student in the early 1930s, he came to appreciate the popularity of skiing in the East. When he returned to Albuquerque in 1935, he and wife Virginia skied by walking up slopes and sliding down. In 1936 he organized the Albuquerque Ski Club. There was no ski area, no tow and nobody to teach them the sport. Skis were wooden; rubber from inner tubes held boots to skis.

That year the U.S. Forest Service built a small warming hut and cleared a slope at Tree Spring in the Sandias. Next the agency established a system of trails, and La Madera Ski Area was born.

In 1940 Nordhaus enlisted and, because of his skiing experience, served in the famed 10th Mountain Division. When he returned after the war, in 1945, he started a rope tow at La Madera. Lift tickets were $1. Nordhaus decided to turn his hobby into a business and formed La Madera Co. He bought the club's assets, sold stock, and built a T-bar lift that was the longest in the nation. But the weather didn't cooperate, and it wasn't profitable for years.

In 1957 Ben Abruzzo became ski area manager and a year later bought half the assets from Nordhaus. Two years later the road to the ski area was paved. In 1963 they added a double-chair lift and a mountain-top restaurant and changed the name of the ski area to Sandia Peak.

Golf

Notah Begay III is from Albuquerque and learned to play at Ladera Golf Course. Half Navajo and half Pueblo, he's the first Native American player to reach top-ten status on the PGA. And he was the only player who could putt equally well right-handed or left-handed.

And another Albuquerquean, Rosie Jones, won more than $4 million during her LPGA career.

Olympics

Cathy Carr West and Trent Dimas are New Mexico's Olympic gold medalists. She won her gold in swimming in 1972 at Munich; he won his in gymnastics in 1992 at Barcelona.

Resources:

Albuquerque Journal: Albuquerque Tricentennial Official Guide.

Garcia, Nasario. Albuquerque Feliz Cumpleaños! Three Centures to Remember.

McIntyre, Wade. State Fair! The Biggest Show in New Mexico.

Salman, Pamela. Sandia Peak: A History of the Sandia Peak Tramway and Ski Area.

Simmons, Marc. Albuquerque: A Narrative History.

Lesson Plan: Sports History
A Brief History of Baseball in Albuquerque
By Lynn Taylor

New Mexico Standards: Standard 10—Students will know and understand the impact of economic systems and institutions on individuals, families, businesses, communities, and governments.

Objective: Using the example of professional baseball, students will learn how sports have evolved in Albuquerque since the late nineteenth century. They will be introduced to facilities, teams, uniform changes, and rules of the game. They will be able to appreciate some of the impacts that baseball has had on Albuquerque's history.

Grade: 4th

Size: 24

Duration: 2 weeks

Setting: Classroom and playing field

Materials:
- Internet
- Cardboard
- Colored markers
- T-shirts and pants (for uniforms)
- Collection album

Courtesy State Records Center and Archives

Background

Organized baseball in Albuquerque had its humble beginnings in 1880 when the Albuquerque Browns first played at the State Fair Grounds. From that point to today, professional baseball teams named the Albuquerque Dons (1932), The Albuquerque Cardinals (1937), and the Albuquerque Dukes (1962), playing at Tingley Field and the Albuquerque Sports Stadium, and the Albuquerque Isotopes (2002) have continued that tradition.

Today the Isotopes, playing in newly renovated stadium lovingly referred to as "The Lab," is the only major professional sports franchise in the city and provides entertainment and revenue for city residents and businesses.

The history and traditions of Albuquerque's baseball teams mirror the evolution of society over the 125 years since they were first formed. These teams represent the development of sports over this period in Albuquerque's history.

Activities

1. Set up an interview with a current Isotope player. Discuss his qualifications, longevity, present position, other teams he might have played for, why he enjoys Albuquerque over other locations. (Albuquerque Isotopes, 1601 Avenida Caesar Chavez SE, Albuquerque, NM 87106, 924-2255) Initial contact should be made through the teacher and coach, or the student could write a letter with five specific questions for a player.

2. Divide the class into five groups, each representing one of the five teams that have played in Albuquerque since 1880. Have each group describe the game and team of that era (uniforms, rules, etc.) and explain what Albuquerque was like (for example, population, principal industries or employers, etc.) during that time period.

3. How was construction funded for the new Isotopes' Stadium? Write a letter to construction engineer Ed Adams using the Isotopes' address from item 1.

4. How has the presence of a professional team affected high school sports (especially baseball) in Albuquerque? Contact the New Mexico Activities Association (NMAA) and do a phone interview with Gary Tripp (923-3271) about the present rules of baseball.

5. How have the rules of baseball changed since 1880? Research the Web sites listed and write a short essay describing the major changes.

6. Create two teams within the classroom. Choose a method for voting on the team names, and tell why their name would be appropriate. Create individual logos and choose a mascot (for example, the Isotopes' mascot is Orbit), and create team uniforms displaying the logos.

7. Play a baseball game with a set of rules based on the historical rules of baseball.

8. Plan a field trip to the Albuquerque Sports Hall of Fame (located in the Civic Center downtown, no specific web site or phone number available).

Extensions

1. Plan a field trip to an Isotopes' game or practice session. Interview players, coaches, and management. Get a tour of the stadium.
2. Make a timeline of the history of baseball in Albuquerque.
3. Make a collage of Pacific Coast League baseball team logos.
4. Make a collection of baseball cards and Albuquerque team photos. Display the collection in an inexpensive album.
5. Write an essay describing how professional baseball has affected Albuquerque's economy. Include an evaluation of the revenue baseball generates. Specify the various types of revenue (e.g., ticket sales, concessions, radio fees, etc.). Use this information to estimate the taxes paid to the city.

Resources

Internet sites

www.minorleaguebaseball.com
www.albuquerquebaseball.com
www. baseball1.com
http://infotut.com/reference/Sports/Baseball/History/Rules/1845
www.rulesofbaseball.com

Books

Burns, Ken. Baseball.

Simmons Marc. Albuquerque: A Narrative History.

"The Mother Road"
Route 66

Today, we take it for granted that we can get in our cars and drive to the next town, the next state, or across the country. That's actually a fairly recent development.

In 1915 New Mexico had 4,250 cars and 92 dealers. But the state's "roads" were more likely to be cow paths or two-track wagon trails. They didn't always connect. There were few bridges, no signs and no services. The journey from Albuquerque to Gallup, for example, was a 13-hour excursion fraught with blown tires, sand traps, arroyos and livestock.

National Old Trails Highway

By 1915 work was underway on a transcontinental highway system called the National Old Trails Highway. That year New Mexicans, along with other Americans, wanted better roads, and the government wanted a more efficient transportation network for mail delivery. In 1916 President Woodrow Wilson signed a bill calling for a national system of highways, which laid the groundwork for public financing.

In 1923 the U.S. Bureau of Public Roads was organized. A nationwide movement made up of hundreds of groups was then pushing for good roads, and they all wanted roads paved through their towns. In the next couple of years, about 250 trails in the United States would gain signs and markers supported by travelers' contributions, but they were confusing, inconsistent and not always accurate.

The Beginning

In 1926 the government started marking the roads with the familiar black and white shields. The numerical designation 66 was assigned to the Chicago-to-LosAngeles route. It would become one of the nation's principal east-west arteries.

Unlike other roads of its day, U.S. Route 66 wasn't east-west or north-south but a diagonal. Initially it linked hundreds of predominantly Midwestern, rural communities to Chicago, which enabled farmers to transport grain and produce for redistribution.

The diagonal configuration was particularly important to the trucking industry, which by 1930 had begun to rival the railroad as the nation's shipper. The abbreviated route between Chicago and the Pacific coast traversed essentially flat lands through more temperate climate zones than northern highways, which made it especially appealing to truckers.

In New Mexico Route 66 originally followed a circuitous 507-mile path. It entered from Texas and passed through Santa Rosa, veered northwest up the Pecos Valley to Romeroville, near Las Vegas, piggybacked on Highway 85 south through Santa Fe, passed through Albuquerque on Fourth Street, and then headed south to Los Lunas before aiming west again.

Realignment

There are two stories about how New Mexico's S-curve got straightened out.

The more interesting story is that Gov. A. T. Hannett, miffed at what he considered a political betrayal, decided to reroute the road to exclude Santa Fe. Laying a ruler across a map between Santa Rosa and Gallup, he told highway engineers to blaze a new route. The curve was straightened by the time Hannett's successor took office in 1927.

The less interesting, and probably more accurate, story is that in 1931 the Bureau of Federal Highways wanted a road that ran straight west from Santa Rosa and debated between Albuquerque and Mountainair. After furious lobbying by both the City Commission and the Chamber of Commerce, Albuquerque prevailed. Maps in that year still show the old route, so this is additional evidence in support of the bureaucratic decision.

Not surprisingly, Santa Fe and Los Lunas objected to losing this lucrative traffic. Road crews pulled together an odd collection of war surplus Caterpillars, tractors and graders and began building a road, slowed on occasion by sugar in the gas tank or sand in the engine. To discourage sabotage, the highway engineer distributed blankets so his men could sleep next to their equipment.

Route 66 through the state was now 399 miles long.

The new alignment shifted Route 66 from Fourth Street to Central Avenue through Albuquerque, and tourist services now sprouted along Central.

The Depression

After 1929, when the Great Depression tightened its grip on the nation's economic throat, one of the government's first efforts at relief was to provide jobs by paying for road construction. From 1933 to 1938 thousands of unemployed young men from virtually every state found work as laborers on road gangs.

New Mexico got its share. Gov. Clyde Tingley would prove himself adept at bringing government money to the state for public works projects. In this way Route 66 was finally paved from Chicago to L.A. Imagine 2,448 glorious miles of all-weather road!

The paving increased travel and new businesses. In 1935 Albuquerque had 16 tourist camps and courts on Fourth Street and three on Central. After the realignment, new clusters of motels and curio shops appeared along Central. The oldest surviving Route 66 motels are the Aztec Motel at 3821 Central NE, opened in 1932; the Town Lodge at 4101 Central NE, in 1935; El Vado, west of Old Town, in 1937; and the De Anza Motor Lodge, in 1939.

During the Depression, Route 66 was an economic transfusion. Besides stimulating the hospitality industry, trading posts and Indian artisans benefited when traders opened stores along the route, offering high-quality rugs and pottery along with the typical tourist fare.

As the Depression deepened, exacerbated by the Dust Bowl, there was a sadder story being told along Route 66, as an estimated 210,000 people migrated to California in desperate search of work. In 1939 author John Steinbeck called U.S. Highway 66 "The Mother Road" in his classic novel of the Depression, The Grapes of Wrath. The book and movie of the same name immortalized Route 66 in the American consciousness.

Post-War Traffic

During World War II the War Department made heavy use of the road for mobilization. But gas rationing nearly dried up traffic on Route 66. It was devastating to roadside businesses.

After the war, as returning soldiers headed west with their families in new cars, Route 66 was humming again. Motels and curio shops flourished, and neon signs proliferated. New kinds of businesses appeared – drive-ins and shopping centers.

Route 66 wasn't just a road – it was a cultural hallmark. In 1946 Bobby Troup, driving his 1941 Buick convertible the length of Route 66 penned his famous song, which Nat King Cole turned into a hit that we're still singing: "Get your kicks on Route 66." And there was a TV show called "Route 66" in the 1960s.

In 1956 the government launched the Federal Interstate Highway system. It was the beginning of the end. By 1966 I-25 and 1-40 were completed through Albuquerque. Route 66 was decommissioned in 1985 after the last segment of I-40 had bypassed it. The black-and-white Route 66 shields came down, replaced by the red, white and blue interstate markers.

Route 66 is hardly forgotten. Today it's part of the National Scenic and Historic Byway system. New Mexico boasts six long, paved segments of Route 66 that are accessible from Interstates 40 and 25. Two of the segments are through Albuquerque. Thousands of Route 66 buffs, including foreign tourists, spend their vacations driving segments of the road. There are numerous Route 66 organizations.

Resources:

New Mexico Route 66 Association, http://www.rt66nm.org
National Historic Route 66 Federation, http://www.national66.com

Rittenhouse, A Guidebook to Highway 66.

Scott, Quinta and Kelly, Susan Croce. Route 66: The Highway and its People.

Wallis, Michael. Route 66: The Mother Road.

Lesson Plan 1 - 3: Route 66
Moving America, 20th Century Style

Plans by Bernice Fiske

Route 66 formed the spine of Albuquerque for many years, bolstering the economy and bringing many new people who subsequently settled here. Many existing buildings on Central Ave. and 4th Street reflect the era of car travel. The route influenced the plan of the city's development through the mid-twentieth century.

Lesson 1: Settlement Timeline

New Mexico Standards:
Social Studies: II-E: 4.3
Math, Alg.: 4.1
Language Arts: I-A: 4.4, 4.5; I-B: 4.2; II-A: 4.1

Objectives: Students will acquire knowledge about Route 66, road travel and roadside business through maps, teacher instruction, written materials and photographs in three topics: Moving America, Twentieth Century Style, Commerce, and Celebration (of a great economy and America's love of car travel). They will apply the knowledge to map work, timelines and discussions. They will then synthesize the information into original designs and writing which will be used to evaluate their understanding of major concepts.

Lesson 1: The student will conceptualize the waves of different peoples who settled in New Mexico by creating a class timeline.

Grade: 4th

Setting: Classroom

Duration: 45 minutes

Materials:

- Butcher paper
- Labels copied and cut apart
- Marker
- Double-sided tape or tape loops to attach labels to timeline.

Background:

People began living here as early as 12,000 years ago. The people we know as Pueblo Indians were recognizable to archeologists around 900 A.D., although they may have been here longer. Navajos and Apaches began arriving in the 1400s and possibly earlier.

Spaniards entered this area in 1540, and colonists came from Mexico in 1598 to Northern New Mexico. Their trail would become El Camino Real, or the Royal Road, from Mexico to Santa Fe. In 1706 settlers moved down the valley from Bernalillo to settle Albuquerque.

In 1821 the Santa Fe Trail opened from the United States to Santa Fe, which was still part of Mexico. It brought both Europeans and Americans to New Mexico. These

people were usually merchants and were young men. Many married into local families; others returned to their nation of origin to return with a bride. The Santa Fe Trail was primarily a merchant trail and brought few settlers.

In 1846 the U.S. Army established a post in Albuquerque, and that brought American soldiers to the town. Many stayed after they mustered out.

In 1880 the railroad was completed to Albuquerque. Many people came here to help build the railroad and then stayed in Albuquerque. And many newcomers arrived on the train.

In the 1920s, more and more people owned automobiles, but roads were terrible, and there was no single route that connected the nation. In 1926 the government began building Route 66, a highway to connect Chicago and Los Angeles. In the mid-1930s, paving was complete.

From about 1935 to 1985 Route 66 brought millions of travelers through the state, and some moved here from the East, California and other states.

Preparation:
Have students prepare for the activity by asking parents a day or so before the lesson when their mother's and/or father's families settled in New Mexico and the Albuquerque area and how they traveled here. For Native Americans the *when* would be more than 500 years.

Set-up
1. Discussion: "How Did our Families Get to New Mexico?"

Each student has two votes – one for the mother's side of the family and one for the father's. Explain that most families have mixed heritages of some sort, so just vote for most of the mother's and father's families.

Ask students who were the first settlers in New Mexico. Ask students to raise their hands to show how many had mothers, fathers or both whose families were in New Mexico 500 or more years ago. Ask the class how they traveled. Elicit that they must have walked. Write "foot" and appropriate tally marks on board. For those who have been here 100 or more years, add these categories:

- Horse
- Donkey and Horse
- Ox-drawn Carreta (cart)
- Covered Wagon
- Stagecoach
- Train
- Car

Ask, "Which method amounts to bringing the most people?"

Set-up discussion may be tallied on white- or chalkboard or on chart paper if you wish to keep it throughout the unit.

2. Settlement Timeline

Prepare classroom timeline: On butcher paper, draw a baseline 6" above the bottom edge. Have the class timeline on the wall, floor or table where students can reach it. Have events copied and ready to be taped on line.

Procedure:

Explain that the students are going to help make a timeline to picture events in the order they happened. The dates will go under the baseline, the events above the baseline.

"Do we know the exact date the first Pueblo Indian stood on the banks of the Rio Grande?"

"Actually the Native Americans arrived in different groups over a long period of time. We can show that with a bracket." Demonstrate drawing an easy bracket under the baseline.

Read the background information in sections. Demonstrate marking the timeline with the date below the baseline. Have students tape event labels above the baseline at a slight diagonal which makes it easier to read and allows extra space for wording.

When the timeline is completed, ask students what it shows. Elicit that it pictures time periods when people settled in New Mexico in large numbers. Ask which kind of travel they now think brought the most settlers. Have students suggest possible titles for the line. Vote for the favorite title and write it above class timeline.

Evaluation:

Informally note how well students were able to help construct the timeline and the quality of their discussion on types of travel. Do individual titles indicate an understanding of timelines as presenting the sequence of events in the settling of New Mexico?

Native American migrations

Spanish settlers

Santa Fe Trail pioneers

Railroad workers and passengers

Route 66 travelers

Lesson Plan 2: Cars and Route 66 Timeline

New Mexico Standards:
Social Studies: II-E: 4.3
Math., Alg.: 4.1
Language Arts: I-A: 4.4, 4.5; I-B: 4.2; II-A: 4.1
Science: III.I

Objective: The students will conceptualize the interrelationship of the development of cars, historical events and the building of Route 66 by creating his or her own time line from given dates and events.

Setting: Classroom

Duration: One hour

Materials:

- Butcher paper, 24" by 60" for class timeline
- Drawing paper, two 6" by 12" strips taped to make one long strip, for each student

Background

When people first started tinkering with putting motors on wagons in the late 1800s, there were no garages, but there were lots of barns and sheds for experimenting. Many "horseless carriages" with steam engines were built. The most successful was the Stanley Steamer. Cars with steam engines took a long time to heat up and were expensive.

About one-third of the cars sold in 1900 had electric motors. They only went about 20 mph, and their batteries had to be recharged every 50 miles. You couldn't drive to Santa Fe in one.

In Germany in 1885 Gottlieb Daimler and Karl Benz, working separately, each developed a gasoline engine, which became the forerunner of what we use today. In the United States various people started small companies and made working, but very expensive, hand-made cars.

In 1901 huge oil fields were discovered in Texas. The price of gasoline became quite low.

A big breakthrough came in 1913 with Henry Ford. He set up a moving assembly line for his Model T. The assembly line had each person doing only one part for each car as it came to him or her on a large moving belt. It wasn't as interesting as having five people team up to build a whole car together, but it was a lot faster. And a lot cheaper. A Model T cost less than $1,000, compared with more than twice that much for a hand-built car.

Money was worth more in those days. A person might only earn a few dollars a day, but cars could be bought by the average person. There were less than 4,000 cars in the U.S. in 1900. By 1930 there were about 27 million cars!

People had cars. Where were they going to go? The government first began sharing the costs of road building with the states in 1916 in order to move

the mail. In 1926 the Chicago-to-Los Angeles road was designated Route 66. We'll look at the route more closely on a map later.

Now let's get more dates that affected the road:

- In 1929 the Great Depression began, and many Americans lost their jobs. They were more interested in eating than in cars and travel.
- The government created many new jobs. From 1933 to 1938 thousands of young men worked to get Route 66 paved.
- From 1940 to 1945 automakers made military equipment for World War II. No new cars were manufactured.

Americans rejoiced when the war ended for many reasons. In 1946 more cars were manufactured and rolled off the assembly lines. The war was over. People had jobs. They wanted to celebrate. They began exploring America. Route 66 was the road that took them across most of the country. They used it for the next 19 years.

Then in 1956 the government passed the Highway Act to build interstate highways, which bypassed many parts of Route 66. Many people began traveling by air. In 1985 Interstate 40 replaced Route 66 as the east-west highway in New Mexico. The old black and white Route 66 signs were taken down. Roadside businesses closed.

The road that was Route 66 still can be seen in some places. People still have their old family travel stories. There are books, pictures and songs. You can still find buildings dating from the old Route 66 days along Central Ave., Fourth St. NW and in Tijeras Canyon. In a few places you can still see the old road.

Set-up

Discussion: "Why Do We Need Paved Roads?"

Quickly review main points of previous discussion: To get to New Mexico, many people walked, rode animals or in carts or wagons pulled by animals, rode the train or came by car. This segment establishes the link between the advancement of cars and widespread road building.

Ask leading questions to make these points:

1. Walking, riding animals or in wagons requires only landmarks like rivers or mountains so people can find their ways.
2. Paths or dirt roads are better because they not only show the way, but usually the easiest way. They are dusty and can get muddy.
3. Trains require rails.
4. Cars can travel on dirt roads, but not very fast or comfortably, and have trouble with dust and mud.
5. Cars travel better on paved roads, and roads are not paved unless there are cars. The two go together.

Procedure:

Rule off ten equal segments on strips of paper with 11 short lines extending downward for dates. (These will be from 1880 to 1980.) For a less mature class you might want to make copies of strips with baseline, date and label lines drawn in.

Demonstrate drawing a baseline on class timeline. On their 24-inch-long strips, students measure and mark with a dot at least four, 2" spots above the bottom edge. Using the marks as a guide, they will use a ruler to draw their baselines. Students then measure and mark off two-inch segments on their lines. Draw short lines downward for dates. Demonstrate with class timeline how to leave one space for a margin and begin numbering by tens from 1880 to 1990. (Excess paper can be cut off later.) Check to see students are able to follow the directions, providing assistance or assigning other students to help as necessary.

The teacher may read the background in this lesson plan or adapt and read portions of the accompanying teacher background. Teacher and students will complete their timelines. Demonstrate how the decades on the timelines are used for placement of actual dates. ("Where would we place 1885?")

Evaluation:

Were students able to construct their own lines, indicating an understanding of the placement of dates and events? Did their titles represent a primary concept of the line?

Lesson Plan 3: Route 66

New Mexico Standards:
Social Studies: II-A:4.1, II-C:4.2
Language Arts: II-C: 4.1, 4.3
Math.,Geo.: 4.3

Objectives: The students will locate Route 66 on both U. S. and New Mexico maps. They will practice map-reading skills by following and writing directions to towns in New Mexico located on Route 66.

Setting: Classroom

Duration: 45 minutes

Materials:

- Copies of U.S. and New Mexico maps for each student
- Crayons or pencils in two colors (An ordinary pencil will work for one color.)
- Overhead copies for teacher use and two colored pens to indicate the original and later route.

Set-up:

Discussion: "How many of you have traveled on parts of what was once Route 66?"

Students (or the teacher, if necessary) name areas mentioned in previous activity until all realize that anyone who has been downtown, in Tijeras Canyon, on West Central or North Fourth Street has ridden on it.

Procedure:

Begin with U.S. map. Discuss the map legend and mileage chart. Using red pencil color the route from Chicago to Los Angeles. Have students count and name the states (8) and the time zones (3) the road passed through.

On the New Mexico map color the final route in red, using blue for the original route, which passed northward. Note the differences between the mileage charts.

Have each student select two towns on the final Route 66 through New Mexico. The student writes the name of the first town on a slip of paper, then writes directions to a mystery place using north, south, east, west and approximate mileage, and passing through several towns before reaching their mystery town. They may backtrack (go west 150 miles from Albuquerque to

Gallup and then east 60 miles to Grants) or even take a side trip on another road. They must begin and end on Route 66. Students exchange slips of paper and follow directions to the mystery place.

Evaluation: Check the maps and mystery directions for accuracy.

Lesson Plan 4-5: Route 66
Commerce

Objectives: The student will identify how businesses meet the demands of the consumers through competition. They will research how businesses gained the attention of customers. They will create an original sign or storefront to attract customers.

Lesson Plan 4: What did long-distance travelers need?

New Mexico Standards:
Social Studies: II-A:4.3
Language Arts: II-A:4.1

Objective: The student will identify needs and wants of travelers and the types of services necessary to meet them by completing a class chart.

Setting: Classroom

Duration: One hour

Materials:

- Chart paper divided into two columns titled *Problems* (subtitle: *Cars* and add second subtitle *Other* later) and *Needs*
- New Mexico and U.S. maps for students
- Books or pictures of vintage cars

Set up:

Class discussion on terrain and land usage in the 1930s to 1960s using the U.S. Route 66 map. Students realize that deserts and mountains created driving hazards, and towns were far apart. Guide students in generating the following points:

- Many more people lived on farms and ranches than today, so there were long stretches of roads between towns that had no stores.
- Illinois and Missouri are fairly flat and have more rainfall than farther west.
- Oklahoma and Texas are also fairly flat, but much drier with areas of dust and weeds.
- In New Mexico, Arizona and California travelers had to pass through both high mountain areas and flat, dry desert.

Procedure:

Show pictures of 1930s cars. Ask students to note how they are different from modern ones. In left column of chart list characteristics: exposed radiator, skinny tires, etc. Read Background Information aloud, read portions of teacher's background

information, or make similar points in your own narrative. Elicit needs and write in *Needs* list on right side.

Narration: The radiator cools the motor. In older cars it was in front and protected only by a grill like a metal screen. Radiators were filled with water through an opening on the top, which had a screw-on cap. The radiators did a good job on flat land and when it was fairly cool. But when the motors were overheated by driving through mountains or through the hot deserts, there were some real emergencies!

(What do you think might happen?) First the motor stopped working, which halfway up a mountain pass or part way across the desert left you in big trouble! The basic problem was that the water in the radiator had boiled and turned to steam. (How do you think this might be fixed?) Add cold water. But watch out! When that radiator cap is unscrewed, the steaming water spews out like a geyser. Lots of people have been badly scalded opening the caps too soon.

Today radiators are bigger, more protected under the hood and use coolant. (Write water or coolant in *Needs* column.)

The skinny tires didn't hold up well for long distances or on rough roads. If you hit a hole, you really bounced because there weren't any seatbelts. The tires had inner tubes filled with air. When the tube got a hole, it could be patched. Today tubeless tires still get flat, so cars then had and now have spares to use for short distances. What is the need? (Fix tire)

The air conditioning on the old cars was . . . air! When you're traveling across the desert in 100-plus degree temperatures, more hot air doesn't help. And for anywhere it's below freezing, more cold air doesn't help. "What is the need?" (shelter).

List these and other suggestions from the students about cars under *Needs*. "What do almost all cars need in order to run?" (gas) "What's the usual problem when they won't start?" (battery)

In *Problems* column draw a line under the car list and write *Other.* "We wrote that sometimes you might need shelter on a long trip. What other things might be something you need or want?" Write student suggestions, which may include: hunger-food, thirst-drink, personal needs-bathrooms, tired-a room for the night, stiffness-exercise, boredom-something interesting to see or do.

In right column you might draw a line and write *Wants*. Suggest that while they may not need it, they may want to bring back something to remember their trip or as a present for someone (souvenirs).

Point at the chart. "Alright. There you are on a mountain road or out in the middle of the desert, and you have things you need. And it's not just you. Thousands of cars with similar needs pass that same spot on the mountain or in the desert every day! The road is finished. Lots of people who need and want things are going by. What do you think will be built next?" (Roadside businesses)

Evaluation: Did the quality of the suggestions for the chart and the final question indicate comprehension of the topic? Did all students participate?

Lesson Plan 5: How does a business attract customers?

New Mexico Standards:
Social Studies: IV-A: 4.2, IV-C: 4.1
Language Arts: II-A: 4.1
Visual Arts: A-1

Objectives: The student will identify characteristics of buildings and signs that might attract customers. They will demonstrate how roadside businesses competed for customers by designing a storefront or billboard.

Setting: Classroom

Duration: 2 one-hour class sessions

Materials:

- Pictures of roadside businesses
- Books with pictures
- List of Web sites
- Art paper, markers

Session I

Set up:

Briefly review previous lesson to establish need for roadside businesses. With pictures from books for examples, students brainstorm ideas for signs, services, and special features to attract customers.

Discuss competition. Refer to the Problems/Needs chart. Students identify the types of businesses that would meet the needs: cafés, filling stations, gift shops, motels. Point out there are businesses every 5 to 50 miles. "How did the businesses get customers to choose their places?"

Procedure:

Pass out pictures of roadside buildings and billboards. It is important to have the students note that, unlike today, stores were right alongside the highway. Have groups identify what types of businesses are located in each picture. Usually they are combinations of cafés, filling stations and gift shops. Sometimes they include motels.

Have students note the billboards and storefronts. Sample questions:

- "What would attract you to stop at this particular place?"
- "Is the building interesting?"
- "What services are offered?"
- "What special attractions?" (See World's Largest Gila Monster)
- "Gift shops usually advertise 'Curios.'"

"Maybe you have visited some of the souvenir or curio stores in Old Town. What kinds of curiosities might there be?" (Anything related to cowboys, Indians, forest and desert animals, and the Southwest even if it doesn't relate to the location you're in. Small canoes were sold here, even though they weren't used in New Mexico.) Many of the items were cheap and made in Japan. Some were handmade and valuable, such as Navajo rugs, large Kachina dolls and Pueblo pottery. Some of the cheap items, if old enough, might be valuable today on an auction site like eBay.

Session 2

Set up:

Have students review their findings by looking at actual Route 66 businesses. Remind students that when they answer questions about what they personally like, it is their opinion. There is no right or wrong answer. Here are some questions:

- "What was the funniest thing you saw?"
- "What was the most outlandish claim made?"
- "What was the most unusual building?"
- "How would I attract customers?"

Procedure:

Using markers and art paper for their finished product, students are to 1) decide on a roadside business, which may be one type or include several types of services, and 2) design a billboard or a storefront which will attract the most possible buyers.

Remind students that their ideas are what is important, not who is the best artist, but that doing careful work will get their ideas across better.

Display finished products on a bulletin board. Have students explain what they did to attract customers.

Evaluation: Was the student able to apply several of the characteristics used by actual businesses? Was the student's work a copy of ideas from the pictures or a more original work?

Lesson Plan 6-7: Route 66
Celebration

Objectives: The student will synthesize information about Route 66 as a road that provided opportunities for travel and commerce by writing a journal entry for the last day of their trip to Albuquerque. They will apply their understanding of sequential events to a fictional timeline. They will illustrate the concept of a concentrated business area with a crayon wash of Central Avenue (Route 66) at night.

Lesson Plan 6:
What was it like to travel Route 66 in the old days?

New Mexico Standards:
Language Arts: II-C: 4.1, 4.3; III-B: 4.4, 4.5
Social Studies: II-E: 4.3

Objectives: The student will integrate information gained in the unit into an original fictional account of one day's journey. The student will create a timeline for the story.

Setting: Classroom

Duration: One hour

Materials:
- U.S. map of Route 66
- Writing paper and pencils

Set up:

Guide students in reviewing the major concepts of the unit. With the invention of cars, roads were needed. Route 66 was both a road to get from one place to another and an opportunity for jobs and businesses. Road travel always has hazards like flat tires and running out of gas, but the early cars had even more: flimsier tires, radiators boiling over, no air conditioning or heaters, etc. Roadside businesses included filling stations, cafés, motels and gift shops.

"You learned how roads were built and some of the things a business owner must do to get customers. Today you are a traveler on Route 66 one day's drive from Albuquerque in 1950."

Have students look at maps. "If you are coming from west of Albuquerque, where might you have spent the night?" (Perhaps Gallup.) "What if you were coming from the east?" (Perhaps Tucumcari)

"You are to write a journal entry telling about your day." Adapt the following requirements for your class or individual students as needed and write on board or make copies.

Procedure:
1. Use the first page to draw a timeline where you will list the time you start and when different things happen.

2. Minimum of one page for the events during your day.

3. Describe the countryside.

4. Tell about at least one emergency like a flat tire.

5. Tell about at least one funny event.

6. You stop at one of the roadside businesses designed by someone else in the class. Tell why you and your family chose the place and what you bought, if anything.

7. Plan your trip so that you are at the top of Nine Mile Hill in the west or come out of Tijeras Canyon in the east after nightfall.

Evaluation: Was the student's timeline reasonable? Did the student's trip indicate an understanding of the differences between travel in 1950 in an old car and car travel today? Did the student utilize writing conventions and new vocabulary?

Lesson Plan 7
Are those lights Albuquerque?

New Mexico Standards:
Visual Arts: B.2

Objectives: The student will portray Route 66 as Albuquerque's main thoroughfare of the first half of the twentieth century.

Materials:

- Pictures of Central Avenue
- Art paper
- Crayons
- Fairly thin, dark blue or black tempera paint
- Wide brushes
- Paper towels or tissues (to blot up excess paint)

Set up:

"It is nighttime. You're riding along. You're tired. Suddenly you can look down from the hill or mountain to see the lights in the Rio Grande valley. Even in the early days it was a breathtaking sight. Albuquerque was famous for its miles of neon. Along Central Ave. the colored neon signs of dozens of stores, restaurants, movie theaters and other buildings brighten the sky. How do you think you might feel when you see this?"

Procedure:

1. Tell students they will paint a crayon wash to portray Central Ave. at night. Students study pictures of Central Ave. to select a section they want to draw. Or some may decide to just do a section seen distantly from the canyon or Nine Mile Hill, where the lights show as patterns and designs, but can't be read.

2. Students draw their scenes, outlining buildings and decorating their signs with neon colors in crayon. The crayon must be very heavy. Then they paint over their whole picture with the dark blue or black tempera paint. The crayon needs to show up well, so avoid painting heavily on the crayon and dab up any paint that sticks to it.

3. The pictures may be displayed with edges pinned together to form a long, bright street.

4. Have students add a last paragraph to their journal entry describing the scene and how they feel when they look at it and imagine the actual street. Have students share journal entries.

Evaluation: Does a class discussion indicate students captured the idea and feeling of the impressiveness 1950's Central Ave.?

Resources:

Books

Peterson, Jeanne Whitehouse and Root, Kimberly Bulchen. Don't Forget Winona. New York: Harper Collins, 2004.
Written for 5-8 year- olds. Beautiful illustrations and a plot that ties in well with several parts of the unit. Would make an excellent Read Aloud choice.

There are many large books with a wealth of Route 66 pictures and text, including:
Kittel, Gerd; Bloom, Alexander; Langer, Freddy. Route 66. New York: Thames & Hudson, 2002.
Witzel, Michael Karl. Route 66 Remembered. Osceola: Motorbooks International, 1996.

Brochure

The Albuquerque Route 66 map is available at no cost from Ed Boles, City Planning Department, 924-3860. (Pick up on the 3rd floor, Plaza del Sol, 2nd and Roma NW.)

Web sites:

City of Albuquerque
www.cabq.gov

Tricentennial site
www.albuquerque300.org
Good list of important dates under City History, plus transportation history in the History Matrix.

www.virtualalbuquerque.com
See pictures of Old Town, La Posada, The Kimo.

New Mexico Tourism Department
http://www.newmexico.org/explore/
Downloadable map.

New Mexico Route 66 Association
www.rt66nm.org/tourism.html
Great site. Let your students wander (although some old pictures do advertise adult beverages on the buildings). Two wonderful maps. The Clickable lets you find out about various towns on 66 and shows original and existing routes. The Historic Map rolls you from town to town with written info. Photos and Postcards from the various towns like the Iceberg in Albuquerque and Blackie's in Moriarty (which added fins like the cars of the 50's to its overhang) are classic.

National Historic Route 66 Federation
www.national66.com

Lesson Plan 1: Kirtland Air Force Base
How Kirtland Came to Albuquerque

New Mexico Standards
Social Studies Strand, Economics: Content Standard IV: Students understand basic economic principles and use economic reasoning skills to analyze the impact of economic systems (including the market economy) on individuals, families, businesses, communities and governments.
Benchmark IV-A: Understand that individuals, households, businesses, governments and societies make decisions that affect the distribution of resources and that these decisions are influenced by incentives (both economic and intrinsic).
Performance Standard 4.2: Describe different economic, public, and/or community incentives (wages, business profits, amenities, and rights for property owners and renters).

Objectives: Students will learn the history of how Kirtland Air Force Base came to be a part of Albuquerque's growth. Students will simulate how city representatives approached the Army Air Corps in Washington, D.C. and make a brochure describing the intrinsic benefits that they see in Albuquerque.

Grade: 4th

Duration: 60 minutes

Setting: Classroom

Materials:
- Paper and pencils
- Tourism brochures for New Mexico

Background

(See "Flying Fortresses, Site Able and Igloos: History of Kirtland Air Force Base."

New Mexico had several positive intrinsic qualities in 1939 to be seriously considered for a new base. Most of New Mexico's communities were isolated, but the crossroad of commerce for nearly 600 years had been here in the City of Albuquerque. Albuquerque had a railroad and was on Route 66, the first cross-continental highway. And the city offered good flying weather.

In the area of innovation, Kirtland is known for two major scientific projects, one being the modification of the B-29 bomber. The other is the Variable Time (VT) Proximity Fuze whose projectile can combat enemy planes, buzz bombs and Baka rockets. At Okinawa, destroyers Hadley and Evans used the fuze in standing off 156 enemy planes. It is also credited for turning the tide in the Battle of the Bulge.

The economy of Albuquerque benefited from the presence of the military and an urban center began to grow. As the initial flying field grew to become three military bases, personnel increased and housing and retail service needs increased. Construction,

wholesale and retail businesses in Albuquerque grew to keep pace. The population of Albuquerque which in 1940 was 35,449 grew by staggering leaps to 201,189 in 1960.

Learning about the history of Kirtland Air Force Base is to understand the growth of Albuquerque. It is difficult to imagine what Albuquerque would have become without this military presence. It is even harder from this point to imagine future growth without Kirtland.

In this lesson, students will make a brochure that represents their view of the City of Albuquerque. Like the 1939 representatives, students will identify the positive qualities of the city and promote these strengths.

Set-up:
Inform students that commerce involves "goods" and "services," which are exchanged in order for more than one person to obtain what is desired.

1. Ask students to name some "goods" that they often exchange through trading between themselves and another person at home or at school (Examples: music CD's, videos, pencils, books, etc.).

2. Ask student to name some "services" that are exchanged for "goods" at home with their parents (Examples: household chores that result in obtaining a bike or skateboard; etc.).

3. Review with students the word "incentive" and explain that incentives are encouragements that stimulate a person to take an action. For example, if you were trying to decide whether or not to play outside, then, good weather would be an incentive to do it. Incentives are helpful when a decision is being made.

Recall with students how the history of Albuquerque has evolved as a crossroad for commerce beginning with prehistoric times.

1. Inform students that excavations of sea shells along the Rio Grande indicate that Native Americans traded "goods" with people who lived by the ocean.

2. Explain that in 1706, a little over 100 people lived in the Villa de Albuquerque. Ask students: Identify some "goods" traded by the Spanish.
   Possible Answers:
   a) Large animals -- horses, oxen and cattle, sheep and pigs
   b) Small animals like chickens and ducks
   c) Field crops like hay and corn.

3. Ask students: Imagine what "services" would be most needed? Answer: People who could help raise animals and till the fields. These workers (peons) were paid a portion of the crops or animals.

4. Inform students that El Camino Real (The Royal Road) connected Mexico City with Santa Fe during the Mexican period (1821-1846). Ask students: What "goods" and "services" would people need during this period?

   Possible Example of goods: furniture, flour, seed for crops etc.
   Possible Examples of services: men to drive the oxen wagons; hunters to get food for travelers; blacksmiths to make things needed in homes and wagons; doctors to help settlers, etc.

5. Ask students to imagine what would be an incentive for people who traveled El Camino Real to Santa Fe.

   Possible answers:
   a) Good jobs in Santa Fe
   b) Good land for grazing animals
   c) Lots of water from the Rio Grande
   d) Climate, etc.

Tell students that they now know what are goods, services, and incentives. Explain that they will need to think about them, as they will make a brochure to give encouragement to someone to want to come to Albuquerque.

Procedures

1. Have students imagine what Albuquerque looked like before World War II (1939). Possible answers are: No Interstates. Route 66 came down Central Ave.; housing development mostly on the East side of the Rio Grande; fewer cars and fewer jobs; population of 35,000.

2. Explain the background of World War II and that the United States joined its allies. It needed "goods," such as machines (planes, tanks, ships) and "services," such as trained pilots and mechanics. Describe how city representatives went to Washington and persuaded the government to locate an air base here.

3. Tell students that they will do any activity in which they will pretend they are representatives from the city and they need to find incentives to encourage someone to come and live in Albuquerque and work at Kirtland Air Force Base.

4. Divide students into groups of four and assign groups to discuss the best qualities about Albuquerque to put in their brochure about the city. (If possible, have travel or other types of brochures that students may examine. Brochures are available from the Albuquerque Convention and Visitors Bureau.)

5. Ask each group to fold a sheet of paper into thirds and either draw or write their information about Albuquerque. (See the suggested format attached.)

6. Assist students by giving them the following questions to discuss in their groups before deciding what to put in their brochure:

a. What is good about the climate in Albuquerque?
b. What are fun outdoor sports in Albuquerque?
c. What are some favorite foods eaten in Albuquerque?
d. Draw a map from your school to Kirtland Air Force Base.
e. Draw a Southwest-style home in Albuquerque.
f. Name some places to visit in Albuquerque?

7. Have each group present their brochure to the rest of the class. Ask students to decide if the incentives in the brochure would make them want to move to Albuquerque.

8. Thank students for their work on this project and display the brochures in the hallway or in the classroom.

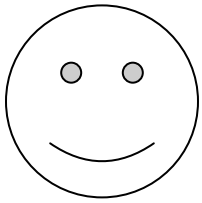
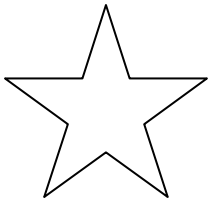
Assessment: Students will be assessed upon their participation during discussion and on completion of their brochure with members of their group.

Extensions:

1. Students may research the type of aircraft located at Kirtland Air Force Base.

2. Students may wish to learn more about Kirtland Air Force Base in general or specific tasks/careers. There in an Education Office at Kirtland Air Force Base (contact them at 846-2677). The 377th ABW Public Affairs Office can be reached at 846-5991.

INSIDE SHEET

What is good about the climate in Albuquerque?  Draw a Southwest-style home in Albuquerque.	What are fun outdoor sports in Albuquerque? Name some places to visit in Albuquerque.	What are some favorite foods eaten in Albuquerque? 

OUTSIDE SHEET

Back Cover Drawing	Draw a map from your school to Kirtland Air Force Base? (Map)	Front Cover Drawing

Lesson 2: Kirtland Air Force
Military Shields at Kirtland Air Force Base

New Mexico Standards
Career Readiness Strand, Content Standard 1: Students will identify their career interests and aptitudes to develop an educational plan that supports personal career goals. Benchmarks K-4: Students will identify places that people work and explain what they do.

Objectives: Students will examine the military shields of Kirtland Air Force Base and identify their mottos and designs. Students will make their own shields that contain their own motto as well as a design that reflects their goals.

Grade: 4th

Duration: 60 minutes

Setting: Classroom

Materials:
- Colored pencils or crayons
- One photocopy of shield of 377th and New Mexico Air National Guard
- Photocopy shield of Kirtland Air Force Base, enough for class
- Drawing paper

Background:

Kirtland Air Force Base and its Sandia Laboratory (formerly Sandia Base) have come a long way from the early days of a training air base for pilots and mechanics. Their experiences in giving support for nuclear weapons, nuclear effects and constant testing has built a vast body of knowledge and training capability. For example, Kirtland worked on the world's largest land-based bomber, the B-36, and the B-47 jet bomber. Kirtland also built the largest simulation facility, the Trestle, to test the effects of radiation. Many Air Force innovations began at Kirtland.

A good deal of the Air Force scientific work includes simulating the effects of nuclear explosions; the information is used to strengthen missiles, missile sites and aircraft.

In the last 20 years, the Air Force Space Technology Center at Kirtland has developed into a focal point for space technology planning and aerospace rescue and recovery. They have also coordinated programs for space missions. During this period, three new laboratories for Weapons, Geophysics, and Rock Propulsion were established.

For additional units, see (See "Flying Fortresses, Site Able and Igloos: History of Kirtland Air Force Base."

As students learn about the different activities of Kirtland Air Force Base, they may develop an interest in thinking about a career in scientific research. This lesson will help students to learn more about occupations at Kirtland Air Force Base. They will also gain an appreciation of how military research at Kirtland Air Force Base has contributed to our nation's defense since World War II. Lastly, there is the potential that students may begin to consider a career in the armed forces.

Set-up:
Ask students if they have ever been to an airfield and what jobs did they observe people doing at an airfield.

1. Allow students to name job titles of workers on an airfield or military base.

2. Discuss if anyone has visited Kirtland Air Force Base and what was their experience.

Tell students that they will learn about the units at Kirtland Air Force Base examining their shields and their motto.

1. Describe the shield as similar to a badge that is worn by a group of workers. For example, the badge worn by a police officer is the shield of the police department.

2. Think of other occupations in which people would have badges or shields. (FBI, firemen, soldiers, etc)

Inform students about the range of services that are offered by Kirtland Air Force Base using the listing from the Background section of this lesson.

1. Give examples of how workers are trained to have special skills. For example, the Air Force Operational Test and Evaluation Center trains 2,000 students a year from all over the world in special operations and combat rescue, helps civilian authorities with local rescues, and supplies people and airlifts during crises. (Kirtland assists with rescuing people who get lost or injured climbing or hiking on the Sandia Mountain).

2. Explain that Kirtland Air Force Base is a special place where over 25,000 people work.

Inform students that the workers at Kirtland Air Force Base started by completing high school in order to learn how to do their jobs.

1. Discuss the importance of completing school in order to get a good start with a career.

2. Have students identify some careers needed at Kirtland Air Force Base: a commander, scientist, pilots, navigators, secretaries, janitors, etc.

3. Encourage students to start thinking about their own careers and what kind of job they would like to do in their lives.

Procedures:

1. Show students the shield of the New Mexico Air National Guard (attached) and ask students to locate symbols on the shield: a yucca, the Rio Grande, mountains, the Zia or sun, and the wing of a fighter plane.

2. Tell students that a shield contains meaningful symbols that represent the job done by its wearer and their location. Explain that the 150th Fighter Wing is the New Mexico Air National Guard and they have aerospace combat capability around the world. Ask students to name some possible jobs in the New Mexico Air National Guard.

3. Show students the shield of the 377th Air Base Wing (attached) which is the host organization at Kirtland Air Force Base. Have students read its motto "Serving Freedom's Finest." Discuss how this motto signifies its support for the 76 federal government and 384 private sector tenants and associate units that are on the base.

4. Have students identify what they see inside of the shield: a tiger's head on the sphere of the world, a flight symbol with a vapor trail. Ask students to name some possible jobs in the 377th Air Base Wing.

5. Distribute copies of the shield of the Kirtland Air Force Base and ask students to examine it closely for the different purposes and location.
   - Locate the helicopter and plane.
   - Locate the Sandia Mountains.
   - Count the stars (3).
   - Locate the atomic signs.
   - Locate the rocket.
   - Locate the Zia symbol of the state flag.

6. Discuss the mottos that are core values of Kirtland Air Force Base and discuss the importance of having these standards where people work to protect our country:

   Service Before Self
   Excellence in All We Do
   Integrity First

7. Optional: Allow time for students to color the mountains purple; the Zia yellow; and the atomic dots pink and blue.

8. Tell students that they will create their own motto(s) and draw three symbols on a shield that will represent a place and a job and then write a short paragraph describing the shield.

9. Divide students into groups of three and distribute drawing paper and crayons or coloring pencils.

10. Have students share their completed shields with the rest of the class.
11. Thank students for their work on the shields and display them in the classroom.

12. Encourage students to learn more about the work at Kirtland Air Force Base and to think about a career for themselves.

Assessment: Students will complete a shield and be able to explain its meaning by writing a short paragraph describing the shield.

Extensions
Students may search the Internet for the descriptions of units at Kirtland Air Force Base at www.kirtland.af.mil/Organizations/index.htm. The shield of the U.S. Air Force can also be found on the internet at www.af.mil/library/symbol.

Resources

Web sites

City of Albuquerque
www.cabq.com

Albuquerque Tricentennial
www.Albuquerque300.org
The Tricentennial site also includes military history.

Kirtland Air Force Base
www.kirtland.af.mil

U.S. Air Force
www.af.mil/library/symbol

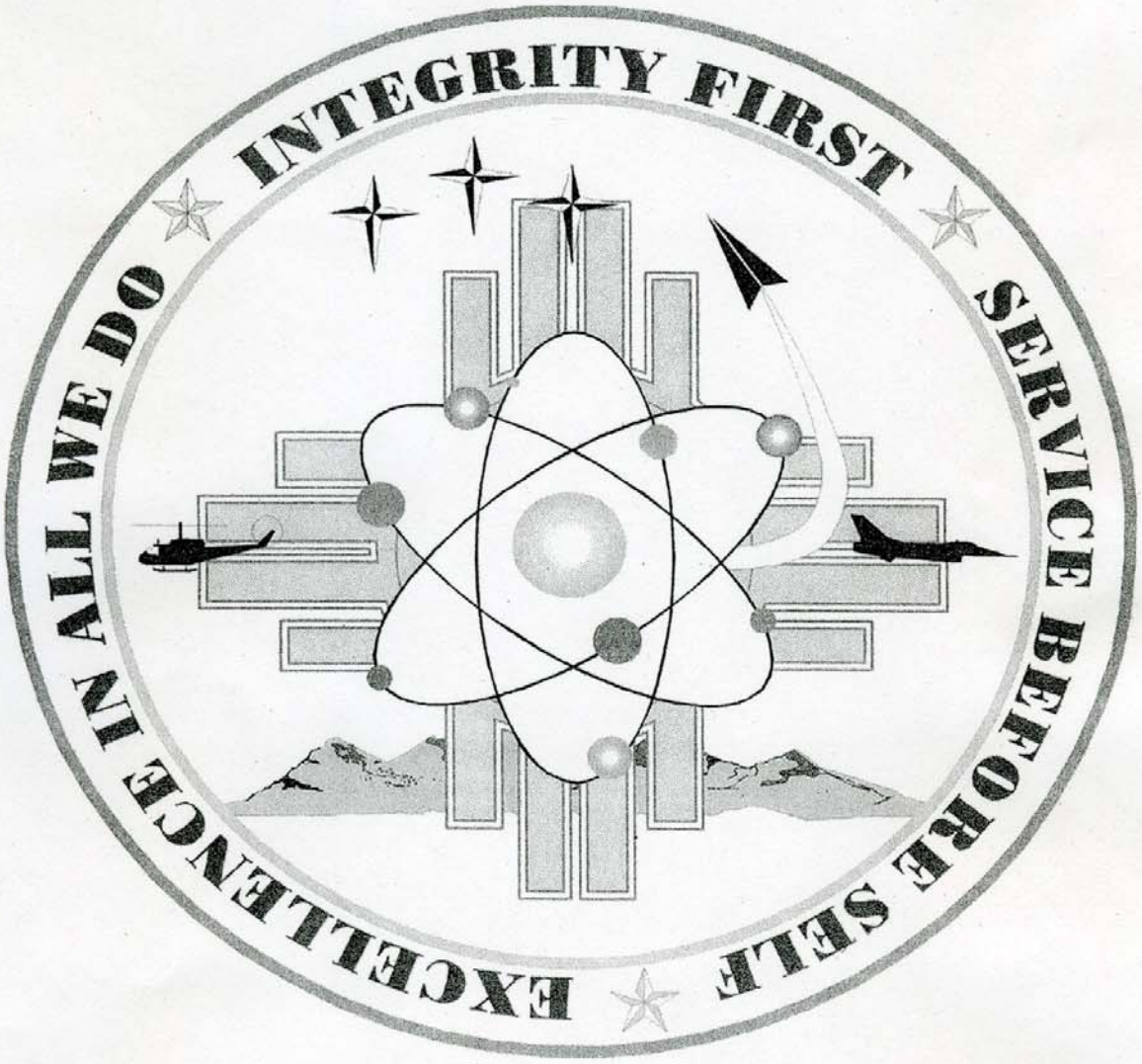
Air Force Materiel Command
www.afmc.wpafb.af.mil

National Air and Space Museum
www.nasm.edu/nasm/

New Mexico Air National Guard

377th Air Base Wing

Kirtland Air Force Base



Flying Fortresses, Site Able and Igloos
History of Kirtland Air Force Base

Kirtland Air Force Base, one of the nation's largest and most complex installations, has its own long history in Albuquerque. It was a natural outgrowth of early aviation efforts in the city, and it's also the product of vigorous and deliberate efforts by the Chamber of Commerce to secure a base for its economic contributions.

Early Aviation in Albuquerque

Commercial aviation got its start here in 1927, when Charles Lindbergh became the first to fly across the Atlantic. Inspired by the feat, two local railroad workers, Frank Speakman and W. Langford Franklin, leased 140 acres on the East Mesa to create an airport. They asked for city help, but the best Mayor Clyde Tingley could do was lend them city equipment after hours. They graded two runways – one about 5,300 feet and the other just under 4,000 feet. James G. Oxnard, a New York air transportation promoter, bought Franklin's interest and expanded the facility in 1928.

In 1929 Western Air Express and Trans-Continental Air Transport (the forerunner of TWA) launched competing passenger, mail, and cargo services between the Midwest and California, and both had operations here. It positioned Albuquerque as an important air traffic crossroads. When Western Air Express built its own airport on the West Mesa, that facility became known as Albuquerque Airport, and the initial airport became known as Oxnard Field. Both were private airports.

In 1935 the field manager of TWA suggested to business leaders that the city should have a municipal airport. At the time the Albuquerque Chamber of Commerce chamber was vigorously promoting an army air base as an economic stimulus to the city, and the group began to pursue both. Board members were actively lobbying personal friends and acquaintances in Washington D.C., and several, especially Oscar Love, Frank Shufflebarger and Ray McCanna often traveled to the capital. They knew it would help Albuquerque's case if it had a municipal airport.

With financial help from businessman George Kaseman, the city got an option on 2,000 acres of land. The City Commission agreed to sponsor a WPA project to build a terminal. Gov. Clyde Tingley had gained favor with President Franklin Roosevelt, and after attending FDR's second inauguration in 1936, he returned with approval for $700,000 to build a municipal airport on the Southeast Mesa.

They still needed matching funds. TWA agreed to a 15-year lease, and Oscar Love's bank took an option on land and advanced money to the city. Tingley turned the first shovel before thousands of citizens in 1937. The municipal airport was completed in 1939.

That year World War II broke out in Europe.

World War II

In 1939 Albuquerque was designated as an Airway Station on the army's southern route, using leased facilities from TWA. The city wanted WPA funding for a permanent

building but lacked matching money. Chamber directors borrowed from two local banks and advanced the money to the city.

In 1940 when the prospect of a base was shaping up, the chamber in August directed Oscar Love to secure an option on land for the chamber. Boosters in Tucson, which was also trying to get a base, had already acquired 16,000 acres adjacent to their airport and deeded them to the army. Six weeks later Maj. Eugene L. Eubank arrived to evaluate the airport site. In early October the army decided to move the 19th Bombardment Group to Albuquerque. In November a military delegation arrived to begin planning $1.25 million in base buildings for some 2,400 enlisted men and officers.

Construction of Albuquerque Army Air Base began in January 1941, with 2,000 men working around the clock to double the length of one runway and build facilities.

The first base commander, Colonel Frank D. Hackett, arrived in March and on April 1, the first military aircraft, a lone B-18 bomber piloted by Lt. Sid Young, landed on the north-south runway. With the assignment of five pilots to the aircraft, the day marked the official opening of Albuquerque Army Air Base.

The summer of 1941 saw the arrival of the first troop train, loaded with 500 base support personnel, as well as arrival of the 19th Bombardment Group, under the command of Eubank, by then a lieutenant colonel. Activity at the base really began to boom with the arrival of 2,195 pilots, bombardiers, and navigator trainees for the new B-17 "Flying Fortress." The 19th Bombardment Group moved out soon after for duty in the Philippines and South Pacific; many crew members would be decorated for bravery.

In 1942, soon after the Pearl Harbor attack in 1941, the base was named Kirtland Army Air Field, after Col. Roy C. Kirtland, an aviation pioneer who was one of the first students to fly with the Wright Brothers and first commander of Langley Field. Appropriately, the first class of bombardiers began with the establishment of the Army's first wartime advanced flying school.

By then, Kirtland's aircraft inventory had grown to 50 AT-11s and 28 B-18s.

Also in 1942, Sandia Base was established nearby as Albuquerque Air Depot Training Station for aircraft maintenance personnel. In 1944 the Manhattan Engineering District created the Armed Forces Special Weapons Project at Sandia Base to coordinate military special weapons activity.

During the war, Kirtland trained entire flight crews for the B-17 and B-24 bombers. The base's three schools -- advanced flying, bombardier training and the multi-engine school -- operated at full capacity. From 1941 through 1945 Kirtland turned out 5,719 bombardiers and 1,750 B-24 pilots. In February 1945, Kirtland Field was also engaged in training combat crews for the B-29 Superfortress, eventually used to drop the first atomic bombs on Hiroshima and Nagasaki. The base continued training B-29 pilots until the end of the war.

When the war ended in 1945, Kirtland went on a standby basis.

After the War

Nuclear weapons began arriving at neighboring Sandia Base from Los Alamos for practice and loading on modified B-29 bombers. In 1946 the Armed Forces Special Weapons Command began building Site Able for weapons storage in the Manzano foothills and Site Baker near Kileen, Texas.

In February 1946, Kirtland was placed under the Air Materiel Command, and its flight training activities ceased. Its new job involved flight test activities for the Manhattan Engineering District, the wartime organization that produced the atomic bomb. The base's new role was to develop proper aircraft modifications for weapons delivery and to determine ballistic characteristics for the weapons of the future.

Kirtland's role in testing and evaluating these special weapons increased in 1947, as the U.S. Army Air Corps became the U.S. Air Force. At that time, Kirtland Army Air Field, with a population of 972 military and civilian personnel, became Kirtland Air Force Base.

New aircraft had to be modified to use nuclear weapons. The first B-36, then the world's largest bomber, arrived in 1948; the first B-47 followed soon after.

Most of the weapon proving was conducted on a 46,000-acre tract in the Manzano Mountains, at the base's southern end and included Forest Service lands withdrawn for testing purposes. This involved setting up artillery emplacements, building observation stations, preparing fragmentation areas, and erecting two 248-foot oak towers near the present day Starfire Optical Range. Kirtland was suitable for these activities because of its proximity to Los Alamos Laboratory and to Sandia Base.

In December 1949 Kirtland became headquarters for the newly created Special Weapons Command. The nucleus of this organization was composed of the pioneering Air Force agencies that had located here to determine future employment of special weapons. The command became the Air Force Special Weapons Center on April 1, 1952, and was a unit of the Air Research and Development Command.

That year Site Able was renamed Manzano Base and came under operational control of the Air Force.

There were now three installations: Kirtland, Sandia Base and Manzano Base.

Work would continue on Manzano Base until 1961 and was so secret that servicemen who worked there couldn't even tell their wives what they did. Manzano consisted of 122 igloos, or magazines – 81 earth-covered bunkers and 41 tunnels in mountainsides – and four plants scattered through 2,880 acres in the Manzano foothills.

The Special Weapons Center assumed management of Air Force Systems Command's test and evaluation facilities at Holloman Air Force Base near Alamogordo during the summer of 1970. A year later, on July 1, 1971, Kirtland, Manzano and Sandia bases were merged under one command.

The Air Force operated the weapons storage depot in the Manzanos until it completed a new underground storage complex in 1990. It's the most modern facility of its kind in the Department of Defense and one of just two nuclear weapons general depots in the United States. The old Manzano storage area, some of which can be seen from the Four Hills neighborhood, was deactivated in 1992.

In 1993 the 377th Air Base Wing became the base's host organization – essentially the landlord for more than 76 government and 384 private tenant organizations with operations at Kirtland. The 377th also manages the base's weapons storage facility.

Kirtland Today

Kirtland Air Force Base is surprising for its size and complexity.

At 80 square miles and more than 23,000 employees, Kirtland is one of the largest installations of the U.S. Air Force. It's also one of the most complex, with three scientific laboratories, two flying organizations, a weapons depot, two headquarters (Air Force safety and systems testing), an astronomical observatory, and the Department of Energy's biggest field office. The base's economic impact on Albuquerque totals $4 billion.

Kirtland's mass and diversity probably spared it in the most recent round of base closures.

Kirtland has two major flying outfits:

- The 58th Special Operations Wing trains 2,000 students a year from all over the world in special operations and combat rescue, helps civilian authorities with local rescues, and supplies people and airlifts during crises.
- The New Mexico Air National Guard 150th Fighter Wing flies and maintains F-16 Fighting Falcon jet fighters. Members of the 150th have seen service in Vietnam, Bosnia, Kuwait, Kosovo, and Turkey. In 2002 they flew air cover over New York City.

Kirtland's best known tenant is Sandia National Laboratories, a DOE facility with some 8,000 employees, but the base is home to two other labs as well – two directorates of Air Force Research Laboratory. One operates Starfire Optical Range, an astronomical observatory in the Manzano foothills.

Air Force Safety Center

Ever since World War I, the government has lost many more planes in training than in combat. That's because a combat pilot is very focused. Noncombat flying lends itself to errors, mechanical failures and what Air Force pilots call "hot-dogging," the equivalent of a teenager in a fast car.

Losses led the Army to start a safety organization in 1925, which evolved over the years to the Air Force Safety Center. This agency, which serves the entire Air Force, is headquartered at Kirtland. Its commander is also Air Force Chief of Safety, reporting directly to the Air Force Chief of Staff. The Air Force consolidated all its safety functions here in 1996.

The Air Force Safety Center investigates Air Force crashes and mishaps, analyzes evidence and interviews people to figure out what happened. It then makes recommendations that may involve improved training and maintenance, changes in policies or parts modifications. The center also concerns itself with ground transportation, weapons, space systems, and nuclear programs.

Much of the Safety Center's efforts are preventive. It assesses risks and hazards and tries to spot trends, then recommends changes and monitors to see how well they work. It also devises mishap prevention and safety programs and oversees safety standards and certification.

The Safety Center has a crash lab on 29 acres of desert scrub, where multiple crash sites have been recreated piece by piece from the original wreckage. The agency uses this plot to train accident investigators and first responders.

The wreckage assembled here is a sampling of what can go wrong. A helicopter lands in a grassy field saturated with water. A strong crosswind tips the craft, and the rotor touches the ground. A training plane crashes when a bolt fails in a control device. A jet is lost because a pilot, unfamiliar with the craft, pushes it beyond its limits.

The agency also studies birds.

One bird can wreak havoc with a multi-ton flying machine after being sucked into engines or smashing through windscreens. (It's a little hard on the bird, too.) And the Air Force has 2,600 strikes a year. One specialist investigates Air Force plane crashes caused by birds. The Bird Aircraft Strike Hazard (BASH) program tries to keep birds and aircraft apart.

The program investigates crashes all over the world, develops programs to reduce bird strikes, and maintains the nation's largest bird-strike database, used for detailed analysis during aircraft component design and environmental assessments. To do this, the Air Force must identify bird remains and know their size, behavior and habitat.

The Air Force and the Smithsonian Institution might seem unlikely partners, but the Smithsonian identifies bird species from remains sent from Air Force personnel. Their instructions: "Collect all feather, fuzz, beak, bone, talons, etc. that are found in the engine, on the aircraft, or on the airfield. Never cut feathers from the bird's body because the fluffy barbs at the very base of the feather are often important in making identifications."

The Safety Center investigates these accidents and others in order to improve Air Force safety practices and training and prevent future mishaps.

Air Force Research Laboratory

Ever wondered who, officially, cares that an asteroid might be headed our way? Locally, it's Air Force Research Laboratory, which has two of its ten directorates at Kirtland: Space Vehicles and Directed Energy.

Space Vehicles is the Air Force Center of Excellence for space research and development. One of its missions is to better understand space and its effects on military systems and operations. Another mission is to improve the performance of space technology (primarily satellites and rockets) while reducing costs by designing standards and prototype hardware and software. In other words, the directorate develops technologies for smaller, lighter, cheaper spacecraft. An example is use of new materials like carbon-fiber composites to reduce the weight of satellites.

The directorate also develops technology for protection from natural and man-made threats arriving from space and conducts space-based surveillance.

The other directorate, Directed Energy, is a Department of Defense Center of Excellence for the development of high-power microwave technologies and lasers, including the Airborne Laser System Program. Mounted on a Boeing 747, the system is intended to destroy ballistic missiles soon after they're launched.

Starfire Optical Range

Who's watching orbiting space junk? Again, Air Force Research Laboratory and its Starfire Optical Range, an astronomical observatory in the Manzano foothills.

The facility keeps an eye on old, dead satellites. Every day scientists get a list of 8,000 objects. The space command tracks 1,000 active payloads and 20,000 objects.

Starfire's 3.5-meter telescope is one of the largest in the world capable of tracking satellites. It also has a 1.5-meter telescope and a 1-meter beam director. Together they can actually shine a beam of light on a satellite and follow it while viewing its image.

In 1983 Starfire caught the world's attention by becoming the first organization to solve the problem of removing the twinkle from stars. Ever since Galileo invented the telescope, astronomers have been hampered by blurred images, the result of atmospheric turbulence.

Starfire scientists devised a way to measure the atmospheric distortions and then distort a mirror in the opposite direction. It sounds simple enough but because the wave front of light changes thousands of times a second, the lenses of the mirror must change as quickly. The Starfire mirror can change 1,500 to 2,500 times a second. When the technology was declassified in 1991 astronomers around the world were ecstatic. Today every large astronomical installation in the world has this technology. For its expertise, Starfire was designated as a federal Center of Excellence.

This really is rocket science.

Resources:

Kirtland Air Force Base: http://www.kirtland.af.mil/history/

Air Force Safety Center: http://afsafety.af.mil/

Air Force Research Laboratory: http://www.afrl.af.mil/

Center for Military History: http://www.au.af.mil/au/awc/awcgate/awc-hist.htm

Biebel, Charles D. Making the Most of It: Public Works in Albuquerque during the Great Depression 1929-1942

"Service in the National Interest"
Sandia Laboratories and High Tech in Albuquerque

Sandia National Laboratories has been a part of Albuquerque for over half a century. Its roots are in engineering design for weapons components, but today the labs do a variety of security-related research and development. Sandia has earned a national reputation in computer science, sensors, space science and materials. It's also a major player in Homeland Security.

From the Beginning

Los Alamos Laboratory was born of America's atomic bomb development effort, the Manhattan Project, during World War II. In 1945 the lab moved its Z Division to Albuquerque's Sandia Base, an aircraft maintenance training site established in 1942 next to Kirtland Army Air Field. Lab managers wanted a site for Z Division that was near an airfield and they wanted to work closely with the military. Z Division then provided engineering design, production, assembly and field testing of non-nuclear components of nuclear weapons. The concrete slabs for the first buildings were poured over the holidays in 1945.

Three years later the division was renamed Sandia Laboratory.

In 1949 President Harry Truman asked AT&T to take over management of Sandia Laboratory, saying the company had "an opportunity to render an exceptional service in the national interest." AT&T began managing the lab and its 1,742 employees on November 1, 1949 and continued for 44 years.

Over the years lab personnel played a role in the Cold War. They were on hand in 1952 when the first H-bomb was detonated at Enewetak in the South Pacific. And when the Cold War ended, they helped former enemies in the Soviet Union dismantle their weapons complex.

In 1956 Sandia opened new facilities in Livermore, Calif. to support the nuclear weapons work of the new Lawrence Livermore Laboratory. Sandia became a national laboratory in 1979.

Sandians and Albuquerque

In the 1950s Albuquerque's eastern and northern limits ended at San Pedro and Lomas. Beyond was barren mesa. Both Kirtland and Sandia were isolated from the city. But they were growing. The war had not only created a new defense complex outside the city – it inflated the city's population. Sandia, driven by Cold War missions, then employed more than 4,000 people. It had become the city's largest single employer.

This workforce for a time lived in base housing, but they began buying homes in the rapidly growing new subdivisions of the Northeast Heights. Residential construction blossomed on the scrubland north of Sandia.

The city didn't have enough wells to serve this new population, although the supplies of water were ample. The existing City Commissions, controlled by the

influential former Gov. Clyde Tingley, was generally unresponsive to the utility needs of a growing city.

A group of Sandia employees decided to involve themselves in city politics. In 1952 a group of Sandians, led by Dick Bice and Ray Powell, formed the Citizens Committee and ran a slate of candidates (including Bice) for the City Commission. The reform group prevailed and took control from the once powerful Tingley. City Commissioner Bice devised a strategy to fund the expansion of the water system.

From 1954 to 1958 the city added 190 miles of pipe to its water system, and water shortages and rationing were history. The city also paved 157 miles of streets, and traffic congestion eased. The city staff increased dramatically. To pay for these improvements, new taxes were levied; the most significant was a one-cent sales tax.

After Dick Bice left the City Commission in 1962, Harry Kinney, another former Sandian, served two terms as mayor (1973-77 and 1981-1985). Kinney asked Bice to chair a Museum Advisory Committee because he knew of Bice's strong interest in creating a city history museum. The result was the Albuquerque Museum, which opened in the old airport terminal in 1967. In 1979 the museum moved to its present location in Old Town. Bice also was instrumental in securing funding for the National History Museum, which opened in 1986.

Sandia Today

Since 1993 Lockheed Martin Corp. has managed the lab. The lab now employs some 8,500 people. Its direct and indirect economic impact in 2004 was $6.6 billion.

Sandia's mission over the years has been to develop technology that supports national security. Currently, its five areas of concentration are:

- Making sure the nation's stockpile of nuclear weapons is safe, secure and reliable;
- Reducing the proliferation of weapons of mass destruction, the potential for nuclear accidents and the threat of damage to the environment;
- Addressing new threats to national security;
- Improving the security and availability of energy sources;
- Protecting against terrorism.

In the course of upholding its mission, Sandia has for years been in the forefront of computer science, materials science and space exploration.

Sandia has been involved in virtually every aspect of computer hardware and software development. It's probably best known in the computer world for massively parallel computing – linking large numbers of desktop computers and getting them to work together. In 1988, Sandia computer scientists linked 1,024 computers to address a complex problem and boosted problem-solving speed a thousand-fold.

As power and graphics capabilities increased, the horizon of problem solving continued to expand. Sandia scientists gained the tools to design pharmaceutical drugs, model global climate changes and simulate the movement of toxic waste through the ground. They could detect 50,000 incoming projectiles and discern missiles from decoys.

Sandia and Cray Inc. are now developing a new supercomputer that will be the fastest in the world. Called Red Storm, the $90 million machine will be capable of 41.5 trillion operations per second (teraflops). Sandia's ASCI Red computer was previously the world's fastest.

A second area of strength is in materials science -- a search for the right stuff to meet demands of space technology, industry and medicine. Airplanes and cars, for example, could be made from lighter, stronger materials for greater safety and fuel efficiency. Demand continues for new materials for semiconductors that make computers smaller, faster and more powerful.

In recent years, Sandia has distinguished itself in bio-terrorism defense and in microsystems.

Sandia was deeply involved in the biosciences before the Sept. 11 tragedy and is now a leader a leader in defense against bioterrorism. It has developed methods to process, manipulate, assemble, detect and utilize biological molecules. The lab's decontamination foam, which neutralizes chemical and biological agents in minutes with no harm to people, was used during the anthrax scare in 2001.

Sandia is also a microsystems and nanotech pioneer. Microsystems are devices smaller than a human hair and larger than a few human red blood cells that can think, act, sense and communicate. They have such widespread applications in transportation, telecommunications and medicine that the tiny machines are considered the biggest thing since the semiconductor.

High Tech and Albuquerque

Albuquerque is home to a mature and growing technology sector. Many of the companies are start-ups based on technology transfer from Sandia and UNM. They include:

- Aerospace and Aviation. Albuquerque has both a decades-old aerospace industry and a growing new aviation industry. The aerospace segment includes more than 100 companies with roots in the earliest operations of Kirtland Air Force Base and the nation's space program. Aviation is an exciting new segment anchored by Eclipse Aviation, which plans to make small jets.
- Biotechnology and Biomedicine. This segment produces everything from instruments and surgical supplies to painless glucose monitors for diabetics. They also develop medical equipment, software and diagnostic tests.
- Electronics. Our electronics segment of about 50 companies is anchored by Intel. Activities include manufacture of computer chips, silicon wafers and electronic components and equipment; development and production of semiconductor measurement tools and training equipment; and electronics fabrication and assembly. Intel, which began operations here with 50 employees in 1980, now has 5,000 employees, and the operation is the largest of its kind in the world.
- Information Technology and Software. Albuquerque's vibrant IT sector is one of the biggest at more than 300 companies. It includes computers, software, telecommunications products and service, the Internet and online services.
- Microsystems. About 30 local companies are either microsystems companies or rely on micro- or nano-technologies.
- Optics and Photonics. Albuquerque's estimated 160 optics companies design, develop and manufacture optics systems and components for both the public and private sector. Activities include laser, sensor, component and instrument manufacturing; production of entire systems; design; and supply. Optics is, simply, the use of light. Photonics is the science of generating, manipulating,

transporting, detecting and using light information energy. The basic unit is the photon.

High Tech Training and Schools

Albuquerque has a pioneering program, started in 2001, to educate students in optics and photonics from middle school through graduate degrees. The Photonics Academy at West Mesa High School teaches high-tech skills sufficient to prepare students for jobs or to continue studies at TVI or UNM.

The Academy of Advanced Technology is a four-year program at Albuquerque High School intended to create career pathways to Albuquerque TVI, UNM and jobs in information technology.

The Math, Science & Technology Partnership is a collaboration between schools, business and government agencies, which started in 2000 to improve K-12 math and science teaching and learning for both APS students and teachers through the use of technology. The Sandia High School Cluster was first, joined a year later by the West Mesa High School Cluster.

Resources:

Sandia National Laboratories: http://www.sandia.gov/about/history/

Lesson 1: Sandia National Laboratories

Materials Science

By Vivian Arviso

New Mexico Standards

Strand III, Science and Society: Content Standard I: Understand how scientific discoveries, inventions, practices, and knowledge influence, and are influenced by individuals and societies.
Benchmark I: Describe how science influences decisions made by individuals and societies.
Performance Standard, 4(2): Know that, through science and technology, a wide variety of materials not appearing in nature have become available (e.g. steel, plastic, nylon, fiber optics).

Objective: Students will gain an appreciation of the role of Sandia National Laboratories through learning about materials science. Students will be introduced to the basics of the atomic structure of an element.

Grade: 4th

Duration: 45 minutes

Setting: Classroom

Materials:

- Chalkboard with chalk (Optional: colored chalk)
- Paper and colored pencils or crayons
- Play dough (red, yellow, and blue colors)
- Toothpicks

Background

See "Service in the National Interest: Sandia National Laboratories and High Tech in Albuquerque." (Note: The proper name is "Laboratories," not "Laboratory."

There are a number of design-test facilities and laboratories at Sandia whose ongoing activity includes research on the following topics:

1. Rocket sled tracks
2. Centrifuges
3. Radiant heat
4. Paper destructor
5. Radioactive and mixed waste management
6. Fusion research
7. Pulsed-power research
8. Short pulsed high-intensity nanosecond X-Radiator (SPHINX)
9. Saturn accelerator
10. Gamma irradiation
11. Hot cells
12. Research reactor

Students may be interested in a particular area of science and technology that could be researched in the school library. Topics similar to those underway at Sandia National Laboratories may evolve into career interests that can also be explored. Many students may also be encouraged with local newspaper articles that have a focus on the work at Sandia.

Set-up:

Explain to students that people have been dependent on natural resources found in their environment for centuries and these natural resources have provided building materials for homes, heat for fires, plant fibers for clothing, foods like wild berries, leaves, and roots, and plant life for animals.

1. Ask students to name some natural resources (trees, water, sunlight, plants, wind, rubber, wood, leather, cotton, and other natural materials).

2. Tell students that after World War II, our society recognized that these natural resources were being depleted and that newer and different materials had to replace some of the natural resources.

3. Ask students to name some new materials that are human-made, which we use in our everyday living (Possible answers: steel, plastic, nylon, polyester, etc.)

Introduce students to the history of Sandia National Laboratories as a research facility during World War II which has expanded to do new research for solutions to global problems, such as finding a way to make newer and lighter materials to replace our limited natural resources.

1. Tell students that research means careful study and investigation to find out the facts that can help to solve problems.

2. Inform students that new research makes an important contribution for everyone living in the world.

Explain that science and technology have changed the way we live as compared to our grandparents and their grandparents.

1. Ask students to identify products that they use which were not available to their grandparents. (Possible answers: cell phones, game boys, iPODS, DVD, satellite television, Global Positioning Systems (GPS), computers, etc.)

2. Inform students that the creation of these products is the result of research work similar to that underway at Sandia National Laboratories.

3. Ask students how these products have made our living easier, more comfortable, more entertaining, etc.

Procedures

1. Tell students that the researchers in the field of materials science test materials to find out their hardness, their resistance to temperature changes (melting and freezing), whether they can conduct electricity, and so on.

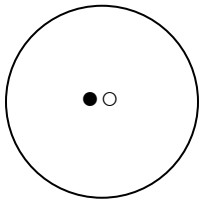
2. Tell students that there are scientists and researchers at Sandia who study materials and are called materials scientists. Their work is to improve existing materials or create new materials.

3. Ask students to think of themselves as researchers involved in the new field called materials science and list some of the demands from society for better materials. (Possible answers: space technology, medicine, safer cars and less accidents, better fuel for cars, heating, and cooking, smaller computers, etc.)

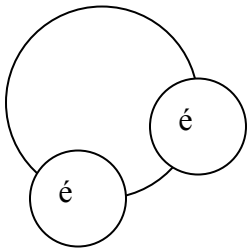
4. Explain to students that a researcher in materials science looks at the atomic structure of a material to see how its atoms fit together and interact.

5. Inform students that they will learn about the basic structure of an atom in an element by drawing atomic diagrams.

6. Use the chalkboard to draw a circle for the nucleus of an atom. Inside, place a proton particle ○ (positive charged particle) and a neutron particle ● (negative charged particle). Option: Use colored chalk to distinguish the proton (red) from the neutron (blue).



7. Tell students that protons and neutrons have an electrical attraction to each other so they form a nucleus, and another particle called an electron é rotates around the nucleus. (Option: Use colored chalk to distinguish the electron (yellow).



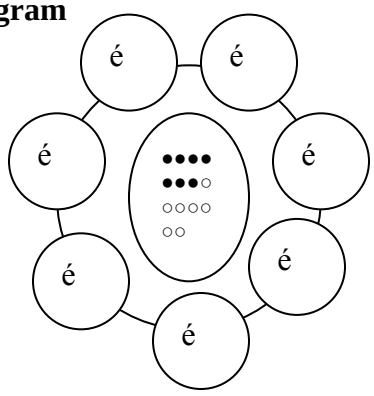
8. Ask students to take out red, blue, and yellow colored pencils or crayons and paper to make their own atomic diagram of an element called nitrogen and distribute the chart (attached).

a) Ask students to use colored pencils or crayons to draw the protons (red) and neutrons (blue) in the center of the paper. Remind them that they are attracted to each other so place them close together in a cluster.

b) Encourage students to draw the correct number of protons (7) and neutrons (7) and then draw a circle around the finished number.

c) Last, ask students to use their yellow colored pencil or crayon to add the correct number of electrons (7), which are identified by the letter é and remind them that electrons revolve around the nucleus.

Nitrogen Diagram



9. Review the nitrogen atomic diagram with students and ask them to apply their knowledge by completing an atomic model using another element from their chart.

10. Divide students into groups of three and distribute play dough (red, blue, and yellow) and toothpicks to each group for the atomic model of their element.

11. Ask students to make small balls of protons and neutrons in a cluster and attach the electrons (yellow play dough) to the nucleus using toothpicks.

12. Congratulate students on making an atomic model.

Assessment: An assessment may be made upon the completion and correctness of the atomic model.

Extensions: Students may be encouraged to do research on materials science as a topic or research a new material like Kevlar that is stronger than steel underwater and is used for bulletproof vests by the military and policemen.

Elements with Atomic Numbers One through Ten

Element	Protons	Neutrons	Electrons
Hydrogen	1	0	1
Helium	2	2	2
Lithium	3	4	3
Beryllium	4	5	4
Boron	5	5	5
Carbon	6	6	6
Nitrogen	7	7	7
Oxygen	8	8	8
Fluorine	9	10	9
Neon	10	10	10

Lesson 2: Sandia National Laboratories

Atoms and Electromagnetic Energy

New Mexico Standards

Science, Strand II: Content of Science. Standard I (Physical Science) Understand the structure and properties of matter, the characteristics of energy, and the interactions between matter and energy.

Benchmark II: Know that energy is needed to get things done and that energy has different forms.

Performance Standard 4(1): Identify the characteristics of several different forms of energy and describe how energy can be converted from one form to another (e.g. light to heat, motion to heat, electricity to heat, light, or motion).

Objectives: Students will review information related to electrons and be able to explain that atoms absorb energy and identify some members of the light family.

Grade: 4th

Duration: 45 minutes

Setting: Classroom

Materials:

- Chalkboard and chalk
- Convex hand lens
- Square piece of paper

Background

See "Service in the National Interest: Sandia National Laboratories and High Tech in Albuquerque." (Note: The proper name is "Laboratories," not "Laboratory.")

Students may wish to have more information about natural resources and the types of resources that exist on a global scale. Trade between countries has assisted countries with fewer natural resources to be able to buy from countries with the needed natural resource, i.e. oil and gas, wood, etc. This may fit with a geographic review of products found in different countries.

This lesson may increase the student's knowledge about the work being done at Sandia. It may provoke new questions about energy resources. It may also inspire students to view the natural world as an important asset for everyone.

Set-up:

Review with students the atomic structure of an atom, its protons, neutrons, and electrons.

1. Use the chalkboard to review the atomic diagram with protons, neutrons and electrons.

2. Draw the atomic diagram with its nucleus of protons and neutrons, reminding students that protons are positive and neutrons are negatives so they attract each other.

3. Emphasize that the role of the electron is to revolve around the nucleus.

Introduce students to the concept of atoms absorbing energy by asking them to recall situations in which light is created (light from a fireplace) or when the sun shines.
1. Tell students that heat and light are absorbed by the atoms of a substance causing the atoms to change and to move about.

2. Explain that this is an interaction called energy.

Review with students what happens to a substance when it is exposed to heat.
1. Ask students what happens when a piece of paper is held over the flame. (Answer: It will burn or catch fire.)

2. Ask students what would happen when a container of water is put over a flame, such as on a stove. (Answer: It will start getting warmer and warmer.)

3. Tell students that inside the atom, the electrons are absorbing the heat and start to move faster and faster the longer they absorb heat.

Tell students that atoms absorb energy from their surroundings, and in this lesson they will see how electrons give off energy.

Procedures:
1. Introduce students to energy forms by describing that electrons can be called "excited" when they absorb heat and start moving faster and faster.

2. Tell students that electrons also give off a pulse of energy when they get too much energy as when water starts to boil.

3. Inform students that radio, X-rays, heat and light are called the light family because they have pulses of electromagnetic energy. These pulses may differ based upon their frequency and the wavelength between pulses.

4. Explain that students will do an activity that will show them that they can see light waves and feel heat waves caused by excited electrons.

5. Write "Heat and Light" on the chalkboard and make two columns titled "Same" and "Different."

6. Ask students to think about heat and light and how they are the same or different. Write down their responses.

Heat and Light

Same:	**Different**
They can be found together. (ex., light bulb)	Light is seen.
They both can burn. (ex., sunburn, burns)	Heat is felt.
They both can heat up things. (ex., sunshine, heat)	
They both can be reflected off shiny surfaces. (ex., fire, flashlight)	

7. Tell students that they will observe a demonstration in which light energy will be converted to heat energy and in this process the atoms change the physical shape of an object.

a. Have students go outdoors to observe your use of a hand lens (convex lens) to direct the rays of the sun through the hand lens onto a small square sheet of paper.

b. Tell students that you adjust the distance of the lens from the paper so that the light coming through the lens becomes a small dot. The dot on the paper will turn dark and then burst into flames.

c. Have students identify the energy that struck the paper (light) and the kind of energy that caused the burning (heat).

d. Tell students that light energy was changed into heat energy and the energy of the atoms changed the physical appearance of the paper.

Assessment: Students will observe the demonstration for turning light energy into heat energy and correctly identify each type of energy.

Extensions:

1. Encourage students to learn about the light family through researching waves in a radio or cell phone.

2. Have students make a report to the class on how the light family helps our lives.

3. Look up the ways in which solar energy is being used as a source for heat and light.

Resource Information

Publication

Albuquerque Journal, *Albuquerque Tricentennial 1706-2006: The Official Guide*, Albuquerque Publishing Co. library at 823-3490.

Web Sites

Sandia National Laboratories
www.sandia.gov
www.sc.doe.gov/production/ober/bak2.html
A website from the Sandia Corp. with lesson plans for teachers.

City of Albuquerque
www.cabq.com
The city's Web site has information about the growth of Sandia National Laboratories.

Albuquerque Tricentennial
www.Albuquerque300.org

Kirtland Air Force Base
www.kirtland.af.mil
The site includes history and general information, including the Sandia.

tinytechjobs
www.tinytechjobs.com
This is a Web site for jobs in nanotechnology.

Lawrence Livermore Laboratory
www.lbl.gov
The site has teacher lesson plans.

The Science Spot
www.sciencespot.net
A site for science lessons for the classroom.

U.S. Department of Energy
www.energy.gov
A site with teacher lesson plans and standards of learning.

Cool Mornings, Hot Air
Ballooning in Albuquerque

October is a time of bright sun, cool mornings, and big, bright-colored, raindrop-shaped globes hovering over the Rio Grande Valley. As we celebrate Albuquerque's Tricentennial in 2006, the Albuquerque International Balloon Fiesta, the biggest event of its kind in the world, will be 34 years old. Albuquerque has earned the title, "Hot Air Balloon Capital of the World."

Early Ballooning

The Montgolfier brothers, Joseph and Etienne, experimented with a taffeta bag lined with paper, closed with 2,000 buttons, and filled with gas made from sulfuric acid and iron filings. After many attempts they launched a balloon without passengers on June 4, 1783 in the town square of Annonay, south of Lyon, France. The hot air in this balloon was produced by burning straw and wool, and it smelled. The balloon traveled 1.25 miles.

The first balloon "pilots" were a sheep, a rooster and a duck. They flew in a Montgolfier hot-air balloon lifting off from the gardens of the Palace of Versailles in France on Sept. 19, 1783. Pilatre de Rozier and the Marquis d'Arlandes made the first manned flight in another Montgolfier balloon on November 21, 1783.

Early Balloons and Albuquerque

Ballooning in Albuquerque goes back to 1882. Just two years after the Atchison, Topeka & Santa Fe Railroad arrived in Albuquerque, "Professor" Park Van Tassel, owner of the Elite Saloon, had bought a balloon for $850. The balloon of black, rubberized cloth was 38 feet in diameter with a volume of 30,000 cubic feet. The price included a grapnel hook, anchor, a basket and a barometer.

The first ascension in Albuquerque was planned for the Fourth of July. All day long on July 3, Albuquerque Gas Works manufactured the Professor's fuel, which was coal gas (a mixture of hydrogen, methane and carbon dioxide) by burning coal in a low-oxygen environment.

Inflation of the balloon began at 5 p.m. on July 3. The next morning a crowd gathered on Second Street between Railroad (Central) and Gold avenues. They waited and waited. Finally, they went on to other events at the Territorial Fairgrounds near Old Town.

Right after 5 p.m., word went out that the balloon would launch at 6:15 p.m. People boarded mule-drawn street cars and made their way back to Second Street. The balloon was only two-thirds full, but it was good enough. The Professor climbed aboard, untied bags of sand from the basket, and the "City of Albuquerque" rose above rooftops and floated slowly to the south. Then it appeared to stop its lateral movement and shot straight up among the clouds where another current of air pushed the balloon in a northwesterly direction.

It was the phenomenon that would become known to modern balloonists as the Albuquerque Box, in which air currents move one direction at a lower elevation and another direction at a higher elevation. The balloon rose high in the air until it was no bigger than a derby hat and soon reached a point over Old Town where it began to descend. The Professor landed in a cornfield at the rear of the Fairgrounds. A number of men on horseback rushed to help the aeronaut and then emptied the balloon and loaded up the airship. They returned to the Elite Saloon for a lively party. The first ballooning adventure over Albuquerque was a great success.

Plans were made for Van Tassel to fly again during the second annual New Mexico Territorial Fair, scheduled to begin Sept. 18, 1882. On Sept. 21, 100 men towed the balloon towards the fairgrounds, but it got away from them, rose quickly about a mile high and burst directly over the Fairgrounds. That was the end of Van Tassel's balloon.

In 1889, again during the New Mexico Territorial Fair, Professor Thomas Scott Baldwin made a 3,000-foot ascension following two failed attempts the previous days. On Sept. 18, 1890, a Professor Elmo only rose 200 feet above Albuquerque and escaped serious injury when it fell to the ground.

Ten years later, again at the fair, a Professor Zeno became tangled in the ropes of his balloon, and the wind blew his parachute, which had opened, and him into the air.

The next balloon pilot's luck wasn't any better. On the last day of the 1907 fair, Joseph Blondin flew solo in his poorly filled balloon. The day before, a company of 25 cavalrymen tried to fill the bag with hydrogen made from iron filings and sulfuric acid in a wooden vat. When that wasn't satisfactory, the soldiers walked the partially filled balloon two miles through the South Valley to the city gas plant in order to continue filling it with coal gas.

At 10 a.m. the next day the bag appeared full, and the men walked the balloon back to the fairgrounds. After it lifted off, Aeronaut Blondin flew 18 miles up the Rio Grande Valley. Near the village of Alameda, irate farmers shot at him eight times but missed. The balloon landed safely near Corrales.

Afterward Blondin sold his balloon to Roy Stamm, a local fruit wholesaler who was secretary of the 1907 Fair Association, and went back to prospecting.

At the 1909 fair, Stamm and Blondin, with a 10-man crew, set to work with a wooden tank generator to produce hydrogen, which had at one point sprayed Stamm with acid. After 30 hours of inflation, the tethered balloon rose, where it could be seen by President Taft from his special train. The first passengers were the ground crew of Fort Wingate soldiers, followed by hundreds of men, women and children who paid $1 to ride – a lot of money in those days – for 10 minutes on a 500-foot tether.

The two couldn't provide a real balloon launch during the fair, but afterward, they rose into the air from a vacant lot at Sixth and Railroad (Central). A large, cheering crowd, including Mayor Felix Lester, watched as the basket cleared the electric wire of the trolley. It rose a mile above Albuquerque, floated over the mountains and was lost from view.

On the other side, the warm air of Estancia Valley caused the balloon to rise to 13,000 feet. As the aeronauts passed over the village of Estancia, they were shot at again. The balloon appeared to be headed for Vaughn but soon dropped and landed at the base of Pedernal Hills in Torrance County. They returned by wagon to Estancia and rode the train back to Albuquerque, bringing the balloon and gondola with them.

A two-hour flight had turned into a three-day return journey.

In the late 1950s a U.S. government research program built a hot-air balloon of man-made fibers and filled it with air heated by a propane flame. The modern hot air balloon was born.

Albuquerque Balloon Fiesta

In summer 1971 Sid and Bill Cutter, owners of Cutter Flying Service, bought a hot–air balloon from Raven Industries. Sid first flew it for their mother's birthday party being celebrated in the company's hangar at Albuquerque International Airport. The Cutters named the balloon "Betsy Ross." It was the first hot-air balloon flight over Albuquerque. Maxie Anderson later acquired the balloon.

In November Sid, Maxie and seven of their friends founded the local balloon club, Albuquerque Aerostat Ascension Association, which they nick-named the Quad A. They signed up members to learn to fly. The Quad A bought a club balloon they named "Roadrunner." It was first flown in early January 1972.

Sid Cutter began organizing the first hot-air balloon rally in New Mexico. The sponsor was KOB Radio, which wanted to celebrate its 50th anniversary with an unusual event. The largest number of balloons ever assembled had been 19 in England, and organizers intended to surpass that number.

They signed up 21 balloonists from Arizona, California, Iowa, Michigan, Minnesota, Nevada and Texas to join the Albuquerque balloonists in April of 1972. But they didn't arrive in time, so 13 balloons inflated on a chilly Saturday morning on the dirt parking lot west of Coronado Shopping Center. KOB announcer Tom Rutherford had stirred up excitement, and 20,000 people came to watch. Albuquerqueans were thrilled watching the brightly colored hot-air balloons, most trailing advertising banners, drifted away from the shopping center.

In this crowd was Don Kersten, an official of the Balloon Federation of America. The Federation Aeronautique Internationale had directed him to choose a site for the first world hot-air ballooning championship. He was so impressed with Albuquerque that he encouraged the city to submit a bid to host the International Festival. Sid Cutter and Tom Rutherford organized World Balloon Championships Inc. and submitted the only bid to be a host city. They learned later that Albuquerque was the only city Kersten approached.

In February 1973 Albuquerque hosted its second Balloon Fiesta in conjunction with the first World Hot Air Balloon Championship at the State Fairgrounds, with 138 balloons flying from 13 countries.

Balloon fever had hit Albuquerque. Cars came to a stop on I-25 as drivers gawked at balloons, and traffic elsewhere was so slow that people were late to work. At the sound of the familiar whoosh of gas burners, people emptied out of buildings and children ran from classrooms to look skyward.

Often a school principal would find both students and teachers still standing outside after the first bell rang because a balloon had landed on the playground. Pilots would sometimes take a child or two up while chase crews held tethers. Later on, teachers took ballooning workshops, and children built and launched small hot air, paper balloons.

An Institution

After several years, Sid Cutter, who had organized and provided financial support to the 1972, 1973 and 1974 Balloon Fiestas, could no longer sustain the financial loss from these events.

Mayor Harry Kinney and many business people knew the fiesta would be good for business, so Kinney appointed the first Balloon Fiesta Committee and named Betty B. Perkins chair.

This committee was established as a corporation, registered with the state on February 9, 1976 and the first bylaws were adopted on February 27, 1976 by the seven members. The original incorporators were Aubrey Cookman, Jim Baca (the city's public relations professional, acting for the mayor) and Betty Perkins.

In March 1976 the Albuquerque International Balloon Fiesta Inc. entered into an agreement with the World Balloon Championships and Epstein Enterprises for the purpose of acting as sales agents to obtain sponsorships.

By 1978 the fiesta had become the world's largest ballooning event, with 273 entries. Gas balloons became part of the Balloon Fiesta in 1981. In 1993 the Balloon Fiesta hosted the 37th annual Coupe Aéronautique Gordon Bennett (also known as the Gordon Bennett Cup, the world's oldest gas balloon race. In 1994, the fiesta hosted the 8th World Gas Balloon Championship and in 1995, it launched America's Challenge Gas Balloon Race, which broke distance records, dating back to 1912.

Ballooning Greats

Albuquerque has produced some ballooning greats.

In August 1978 Albuquerque balloonists Maxie Anderson, Ben Abruzzo and Larry Newman were the first to make a trans-Atlantic balloon crossing in a helium balloon called the Double Eagle II. They lifted off from Presque Isle, Maine, and flew 3,107.61 miles in 137 hours, 5 minutes and 30 seconds, landing in Misere, France.

During an attempt a year earlier Anderson and Abruzzo had to ditch their first craft, the Double Eagle, during a storm near Iceland.

In 1981 Abruzzo, Newman, and Ron Clark of Albuquerque and Rocky Aoki, of New York and Tokyo, became the first to cross the Pacific Ocean in a helium balloon. They departed from Nagashima, Japan and flew the Double Eagle V 5,768 miles, landing near Covelo, California.

Anderson died in a balloon accident in Germany in 1983. Two years later Abruzzo died in an airplane crash. To honor their memories, the city will open the Anderson-Abruzzo Albuquerque International Balloon Museum in fall 2005. The museum will feature ballooning equipment and memorabilia.

Carol Rymer Davis in 1980 established a new world record in the AX-5 category with an ascension of 31,791 feet in a hot air balloon near Albuquerque. She also set records for distance and duration in later flights.

Balloon Q&A

How do hot-air balloons work?

Hot-air balloons operate on the principle of gravity and the fact that hot air weighs less than cold air. This is how the Montgolfier brothers discovered the concept of a hot air balloon in 1783. They noticed the light ash from burning paper in a fireplace rose up the chimney. Then they filled paper balloons with hot air from a fire and noticed they too rose.

This is the same principle used in today's modern hot-air balloon. As air inside the balloon is heated, it rises. As the air inside the balloon cools, it descends. Pilots add heat by turning on the burners, usually in a series of a few short blasts, and the balloon rises. They can allow the balloon to cool naturally to descend or open a vent to release hot air. For a controlled descent, they again use a series of short blasts to control the rate of descent.

What is the Albuquerque box and how does it work?

The Albuquerque Box is a phenomenon that makes our city the ideal place for ballooning. During the fall, when the air is stable and no strong weather systems are affecting the area, the air near the ground cools at night. Because this cooler air is more dense, it flows downhill, like a river, during the early morning hours and pools at lower elevations, especially the Rio Grande valley. This layer of air is shallow, maybe several hundred feet deep.

In October, we often have a light north wind, less than 10 mph, in the morning. The stable river of cool air occurs below a temperature inversion which separates it from warmer, less dense air above the inversion. The wind direction in the air mass above the shallow inversion can be quite different than that below the inversion.

In an ideal box pattern, the wind blows in exactly the opposite direction, with a north wind at the surface and a south wind above the surface. This allows a skillful pilot to bring a balloon back to near the point of takeoff by changing altitudes to ride wind currents in different directions. So, the box is a straight run south from the balloon field, a climb of about 1,000 feet to a north-flowing current to fly back across the field, a descent back into the shallow pool of south-flowing air, and with a little bit of luck, possibly back to the very spot from which the balloon was launched. In effect, the balloon's flight path has traced out a box – the Albuquerque Box.

How do you learn to fly a balloon?

There are two levels of balloon pilot ratings – private pilot and commercial pilot. The private pilot must have at least 10 hours of flight time in free balloons, which must include six flights under the supervision of an instructor. The private pilot must pass a written test, oral test and a flight check before receiving a private pilot's license.

The commercial pilot must have at least 35 hours of flight time, of which at least 20 must be in balloons (the remaining 15 hours may be in other aircraft). The commercial pilot must pass an additional written, oral and flight check before receiving a commercial pilot's license. The holder of a commercial pilot's license may operate a balloon for hire and give flight instruction.

Balloonists must have an FAA pilot's license. A person must be at least 16 years old and have no medical condition that would prevent operating a balloon.

What does the balloon pilot need to know about weather?

Balloons generally launch, fly and land in winds less than 10 mph, so the first weather information sought by a pilot is wind speed. Because balloons can't be steered, wind direction is also important. Balloons generally fly only in daylight hours, but special signal lights suspended below the gondola would make the balloon legal for nighttime operation.

Everyone has seen the Dawn Patrol when arriving at Balloon Fiesta Park before sunrise. These specially equipped balloons time their launch so that they land in daylight. Balloons usually fly only on clear days and are not allowed to fly into clouds. Balloons are much more fragile than fixed wing aircraft, so balloon pilots keep an eye out for changing conditions, such as storm clouds or thermals (dust devils). Turbulent air can be very dangerous to balloons, and at the first sign of such activity a pilot usually decides to land.

Ballooning Today

Today the city of Albuquerque is known as the "Hot Air Balloon Capital of the World," and the Albuquerque International Balloon Fiesta attracts tens of thousands of visitors every year. It is held at the 360-acre Balloon Fiesta Park in October. This event includes mass ascensions, special shape events, evening balloon glows, fireworks, gas balloon races and, of course, hot-air balloon competitions.

References:

Albuquerque International Balloon Fiesta:
http://www.balloonfiesta.com/Education/History/i_history.php

Anderson-Abruzzo Albuquerque International Balloon Museum:
www.balloonmuseum.com

Arizona Balloon Club: http://www.ballooningaz.com/html/balloon_history.htm

Garcia, Nasario. Albuquerque Feliz Cumpleaños! Three Centuries to Remember.

Salman, Pamela. Sandia Peak: A History of the Sandia Peak Tramway and Ski Area.

Lesson Plan: Ballooning

By Susan Davila

New Mexico Standards

Strand I: Scientific Thinking and Practice. Standard I: Understand the process of scientific investigation and use inquiry and scientific ways of observing, experimenting, predicting, and validating to think critically.
Benchmark K-5: Use scientific methods to observe, record, analyze, collect, predict, interpret, and determine reasonableness of data.
Strand II: Content of Science. Standard I: (Physical Science) Understand the structures and properties of matter, the characteristics of energy, and the interactions between matter and energy.
Benchmark II K-5: Know that energy is needed to get things done and that energy has different forms.
Strand II: Expressive Language Writing. Content Standard I: The student writes effectively for different audiences and purposes using appropriate writing strategies and conventions.
Benchmark K-5: The student develops and uses writing strategies and conventions across content areas to describe, narrate, express, explain, persuade, and analyze for a variety of purposes and audiences.

Grade: 4th

Duration: 2 to 4 hours

Setting: Classroom

Background

See "Cool Mornings, Hot Air: Ballooning in Albuquerque."

Questions:

- Does air take up space?
- Does air have weight?
- What effect does temperature have on air?
- How does a hot air balloon rise?

Setup: Give a brief history of ballooning in Albuquerque to the class. Discuss the students' personal experiences with the Balloon Fiesta, reactions to seeing the balloons etc. Teachers may want to assign a short writing assignment about the discussion.

Procedures:

Students work in groups investigating the key scientific principles that make lighter-than-air flight possible. They rotate from station to station completing each activity and recording results on the worksheet provided. Each activity should take between 15-20 minutes. If time is an issue, do only 2 of the activities a day. Have each activity's directions written on a large index card and placed at each station with all needed materials. Each group reads the directions and proceeds with the activity. Individual students should have their own worksheet but each group discusses their

results together. The teacher may need to replace some materials or water after each rotation.

Activity 1

Objective: Demonstrate that air takes up space.

Materials:

- Clear plastic cup
- Paper towel
- Large see-through container filled two-thirds with water

Procedure:

Crumble up a paper towel and jam it into the bottom of a clear plastic cup. Hold the glass upside down and, keeping it straight, push it completely under water.

What conclusions can you make about air? Record your results and conclusions in complete sentences on your worksheet.

Teacher Explanation: Air is everywhere and takes up space. Air takes up space in the glass and acts as an invisible wall between the water and the paper. In ballooning the envelope of a hot-air balloon contains air and the air fills up the balloon to give it shape.

Activity 2

Objective: Demonstrate that air has weight.

Materials:

4 identical balloons
Long wooden dowel (about 36 inches)
Pencil with flat sides
2 equal-size jars or cans
Tape

Procedure:

1. Blow up two balloons to equal size. Blow up third larger than first two. Blow up the fourth smaller than the three. Tie a 5 to 6-inch string to the top of each balloon and then tie a loop large enough to fit over the dowel.
2. Put a mark on the middle of the dowel
3. Place the two jars or cans upside down about 6 inches apart on a table. Rest the pencil across the two cans or jars.
4. Place the middle of the dowel across the pencil so that it is level. Secure the dowel with a piece of tape.
5. Put the balloons of equal size on the ends of the dowel. What happens?
6. Take off one of the balloons and put on the largest balloon. What happens?
7. Take off the large balloon and put on the smallest balloon. What happens?

What conclusions can you make about air? Record your results and conclusions in complete sentences on your worksheet.

Teacher Explanation: Air has weight. Weight is the measure of the force of gravity on an object. The two equal-sized balloons should have kept the dowel level. The larger balloon should have tipped the dowel downward and the smaller balloon should have tipped the dowel upward. Because air has weight, something needs to change the air so that it will cause the balloon to rise.

Activity 3

Objective: Hot air takes up more space than cold air.

Materials:
1 liter plastic bottle
1 balloon for each group
2 plastic buckets
Ice water
Hot water

Procedures:

1. Fill one bucket with ice water and one with hot water. The water needs to be a little hotter than tap water and may need to be reheated as each group rotates.
2. Fit the balloon over the mouth of the bottle.
3. Place the bottle in the container of hot water. You may need to hold the bottle with your hand. Keep the bottle in the hot water until you get a reaction from the balloon, about 3 to 5 minutes.
4. Place the same bottle in the ice water and notice what change takes place.

What conclusions can you make about air temperature? Record your results and conclusions in complete sentences on your worksheet.

Teacher Explanation: Warm air expands and thins as its molecules spread farther apart and the air becomes lighter. When air inside the bottle was exposed to hot water, it expanded, rose into the balloon, and caused the balloon to inflate. The cold water caused the molecules to draw closer together, the air became heavier, and it deflated the balloon.

Activity 4

Objective: Show hot water rises and cold water sinks. Air and water react the same to temperature changes.

Materials:

- One cup with a handle (coffee cup) filled with hot water
- One cup filled with ice water
- One large clear glass jar
- Blue food coloring

Procedures:

1. Place 1 to 2 drops of food coloring into the hot water.
2. Pour the hot water and ice water into the glass jar.

3. Observe what happens to the water.

What conclusions can you make from the mixture of hot and cold water? Record your results and conclusions in complete sentences on your worksheet.

Teacher Explanation: The hot water is lighter than the cold water, therefore the hot water rose to the top of the jar. This is clearly visible because of the blue food coloring added to the hot water. Explain that hot air and cold air react the same way. When the air inside the balloon is hotter than the air around it, the balloon will rise.

After all activities are completed, have a class discussion of the results. Write responses from each group on the board. The teacher can then give the scientific principles the students may have missed.

- Air takes up space.
- Air has weight.
- Hot air takes up more space than cold air because the molecules spread apart and cause the hot air to become lighter.
- Hot air rises and cold air sinks.

Have each student write a paragraph with a minimum of 8 sentences explaining how a hot-air balloon works. They need to include all the concepts they have learned in their explanation.

Extensions:
1. A landscape drawing that contains one or more balloons.
2. An oral report
3. Have students type their paragraphs on the computer and locate pictures of hot-air balloons to insert on the page. This would require access to the Internet.
4. Contact a hot-air balloonist to speak to the class. For a list of speakers call Kathy Leyedecker at 228-9874.

Resources

Brown, Dick. Albuquerque's Early Ballooning Heritage

Stone, William. New Mexico Then and Now.

eballoon.org
http://www.eballoon.org/

Young Engineers Clubhouse
http://education.usace.army.mil/clubhouse/science/experiment.cfm

Student Worksheet

Names of team members

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

Activity #1

Explain the results and relate the results to hot air ballooning.

_____
_____
_____
_____
_____
_____

Activity #2

Explain the results and relate the results to hot air ballooning.

_____
_____
_____
_____
_____
_____

Activity #3

Explain the results and relate the results to hot air ballooning.

_____
_____
_____
_____
_____
_____

Activity #4

Explain the results and relate the results to hot air ballooning.

_____
_____
_____
_____
_____
_____

Lesson Plan 2: Ballooning
Planning a One-Day Hot-Air Balloon Trip
By Tonie Mendez

Standards:
Strand II Reading Analysis: Students respond to, examine, and critique historically and culturally significant issues and events portrayed in literature that both illustrate and affect people, society and individuals.
Strand III Expressive Language Writing: Students write effectively for different audiences and purposes using appropriate writing strategies and conventions.
Strand IV Expressive Language Speaking: Students speak effectively for different audiences and purposes using appropriate speaking strategies and conventions.
Strand III Geometry, Spatial Sense, and Measurement: Students demonstrate an understanding of concepts, properties, and relationships of geometry and measurement through experiences with meaningful mathematical problems that focus on identifying, classifying, visualizing, comparing, estimating, and measuring various aspects of shapes and objects.
Strand IV Data Analysis, Statistics, and Probability: Students identify patterns and special features of data and events of chance through experiences with meaningful mathematical problems that focus on comparing, predicting, representing data, and making decisions to communicate mathematical understanding.

Objective: Students will demonstrate skills and knowledge learned about hot air balloons by preparing a one-day trip within New Mexico, beginning and ending in Albuquerque. They will demonstrate skills learned in mapping, graphing, estimating, as well as creativity when designing their balloon or writing skills as they keep their log book.

Grade: 4th

Duration: One hour for five days, as follows: Two days of one-hour review of prior skills (if needed, if not then only 3 days are required for this activity); three days of one hour for trip planning, preparation and completion.

Setting: Classroom

Materials: Portfolio to include:
- Logbook
- Map to graph trip
- White Drawing Paper (8 by 12) for balloon designing
- Obstacle Box and obstacles (written)
- Journal

Background:
The Albuquerque International Balloon Festival is the world's largest. This lesson will give students an idea of what balloonists go through each time they lift off. See "Cool Mornings, Hot Air – Ballooning in Albuquerque" preceding these lesson plans.

Contained within this lesson are essential questions to be used for discussion with this article. Also, have the students use the Web sites indicated in Resources for further information.

Set-up:

The teacher will begin with a review of prior skills and knowledge, introducing the make-up of a balloon, the history of ballooning and the previous lessons in science on air and its properties.

The students will have skill and knowledge in the following areas:

- Research on ballooning, use of dictionary, classification skills
- History of Ballooning, Identification of Vocabulary from Ballooning
- Weather concepts, cause and effect
- Geography and mapping
- Math, graphing and estimation

Procedures:

A. Review prior skills and knowledge.

B. Read "Cool Mornings, Hot Air – Ballooning in Albuquerque"

1. The teacher may read the information to the students, or
2. The teacher may copy and have the students read parts, or all.

C. Discuss, using essential questions.

If I were a captain of a hot-air balloon, how would I plan a one day trip?
Where would I go?
What would I take?
What would I see?
How does a balloon rise and fall?
How do I gather weather information?
What clothes would I need to take?
What would my balloon look like? Why?
How would traveling in the air be different from traveling on the ground?
What are our safety measures?
How would I manage time and resources?
What might the ground look like form the air?
How will the weather affect travel?
How much will it cost?
What are the regulations for flying, getting a pilots' license?
How would we get back home?

Logbook

A. The students will need to complete this in order to begin the trip. The following information needs to be included in the logbook:

- Destination, including a map
- List of materials
- Design of each student's balloon

- Names of your pilot and chase crew (team of students working together)
- List of regulations
- Estimated time of departure and arrival
- Approximate distance
- List of safety measures
- List of justifications of each crew's budget
- Plan to return home
- Weather conditions that would permit travel

B. Each team's logbook needs to be approved by the teacher

Journal of the Flight
Each team will work together to keep one journal, or each student will keep an individual journal.
A. Day 1: Journal Entry 1: The Night Before Your Trip
This is the entry of the beginning of each team's trip. In this section the team will describe how they are feeling about leaving tomorrow. Are they scared? Why? Why not? What are your expectations? When this entry is made, the pilot (team captain) will go to the "obstacle box" and draw out an obstacle. This will tell the team what problem or situation they will encounter.

B. Day 2: Journal Entry 2: Day of the Flight
This entry will tell of the team's experiences and feelings. In this section the team will tell of the obstacle the team encountered and how the team dealt with it. This is the time to note how the weather affected your flight. The team will want to note their observations of the landscape, and how they returned home.

C. Day 3: Journal Entry 3: The Day After
In this section the team will want to tell what they have learned. Have the team reflect on the experiences they had with their flight. Please include the research they have done, the logbook and describe the obstacle encountered and what the team did about it.

List of Obstacles
A. The teacher may wish to have the students brainstorm a list of obstacles. Here are some examples:

- Sandia Mountains
- Landing in the Rio Grande
- A large goose hits the envelope and tears a hole in it.
- Manzano Mountains
- The volcanoes to the west
- The balloon goes down in the Jemez Wilderness.

EVALUATION:

RUBRIC

Logbook Completion	50 Points
The Logbook must be:	
Neat	10 Points
Organized	10 Points
Labeled	10 Points
Correct grammar	10 Points
Correct spelling	10 Points
Journal Entry 1	
5 reasons to explain feelings	10 Points
5 reasons for expectations	10 Points
Reasonable feelings and expectations	5 Points
Journal Entry 2	
Demonstrate ability to over come obstacle	15 Points
Description of landscape	5 Points
Include how the team returned home	5 Points
Journal Entry 3	
Reflects experiences of research	10 Points
Reflects entries in the logbook	10 Points
Reflects experiences of their journey	10 Points
Total Points	125 Points

Extensions: Create A Quilt

1. Give each student a blank 12 by 12 blank piece of paper.
2. Student will draw a design of their balloon.
3. Student will get design approved by the teacher.
4. Student will transfer the drawing to a 12 by 12 inch square of fabric using a pencil.
5. The student will use markers or Tempera paint to color in the balloon.
6. Allow the color to dry.
7. Have an adult sew the squares together.
8. Attach a quilt backing to the completed class quilt.
9. Hang up and display the class quilt.

Resources:

Albuquerque Tricentennial Official Guide, published by Albuquerque Journal

www.eballoon.org/history-of-ballooning.html