# NEW MEXICO

# Giant Traveling Map Lesson

**TITLE / AUTHOR:  New Mexicans on the Move / Jacqueline L. Waite**

**New Mexico Learning Standards/Social Studies**

## Grade 4: Geography

Benchmark II-A: 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.
- Apply geographic tools of title, grid system, legends, symbols, scale and compass rose to construct and interpret maps;

Benchmark II-E: Describe how economic, political, cultural, and social processes interact to shape patterns of human populations, and their interdependence, cooperation, and conflict.
- Explain how geographic factors have influenced people, including settlement patterns and population distribution in New Mexico, past and present.
- Describe how geographic factors influence the location and distribution of economic activities.
- Describe types and patterns of settlements.
- Identify the causes of human migration.

## Grades 5-8: Geography and Government

**Geography:**

Benchmark 2-A: analyze and evaluate the characteristics and purposes of geographic tools, knowledge, skills and perspectives and apply them to explain the past, present and future in terms of patterns, events and issues:
- describe patterns and processes of migration and diffusion; and provide a historic overview of patterns of population expansion into the west by the many diverse groups of people (e.g., Native Americans, European Americans and others) to include movement into the southwest along established settlement, trade and rail routes.

Benchmark 2-B: explain the physical and human characteristics of places and use this knowledge to define regions, their relationships with other regions, and their patterns of change:
- describe geographically-based pathways of inter-regional interaction (e.g., the Camino Real's role in establishing a major trade and communication route in the new world, the significance of waterways).

Benchmark 2-E: explain how economic, political, cultural and social processes interact to shape patterns of human populations and their interdependence, cooperation and conflict:
- explain how human migration impacts places, societies and civilizations;
- describe, locate and compare different settlement patterns throughout the world; and
- explain how cultures create a cultural landscape, locally and throughout the world, and how these landscapes change over time.
- analyze New Mexico settlement patterns and their impact on current issues;
- describe and analyze how the study of geography is used to improve our quality of life, including urban and environmental planning; and

- explain the accessibility to the New Mexico territory via the Santa Fe trail and the railroad, conflicts with indigenous peoples and the resulting development of New Mexico.
- explain and describe how movement of people impacted and shaped western settlement.

**Government**
Benchmark 3-A: demonstrate understanding of the structure, functions and powers of government (local, state, tribal and national):
- explain the roles and relationships of different levels of the legislative process, to include: structure of New Mexico legislative districts (e.g., number of districts, students' legislative districts, representatives and senators of the students' districts);

# Grades 9-12: Geography
Benchmark 2-E: analyze and evaluate how economic, political, cultural and social processes interact to shape patterns of human populations and their interdependence, cooperation and conflict:
- Analyze the factors influencing economic activities (e.g., mining, ranching, agriculture, tribal gaming, tourism, high tech) that have resulted in New Mexico's population growth;
- Analyze the interrelationships among settlement, migration, population-distribution patterns, land forms and climates in developing and developed countries;

## OBJECTIVES:
Participants will:
- Learn about major cities in New Mexico during three different historical periods
- Practice using grids and cardinal directions to locate cities in the state
- Practice using latitude and longitude lines (if appropriate for grade level)
- Analyze change over time
- Discuss topics such as the census (source of data), distribution of resources in the state, physical features associated with settlements, and implications of changes in population for political representation at various levels of government

## RECOMMENDED GRADES: Fourth through adult

## TIME NEEDED: 20 to 25 minutes, depending on whether discussion is held as part of the map visit or at a later time

## MATERIALS:
- Compass rose
- 15 flat markers
- 15 tall cones
- 15 shorter, flexible cones
- 3 to 4 plastic chains for dividing the state
- List of New Mexico cities by population for 1910/1960/2010

## PREPARATION:
- Discuss reasons why people choose to live in different places
- Review historical settlement patterns in New Mexico

- Review New Mexico era information. See "Timeline of New Mexico History", http://newmexicohistory.org/timelines/. Can also consult various texts, such as Sanchez, Spude & Gomez (2014). *New Mexico: A History;* Sides (2006). *Blood and Thunder: The Epic Story of Kit Carson and the Conquest of the American West*. Additional sources can be found at the conclusion of the lesson.
- Develop predictions by participants about where they think people might live
- Consider push and pull factors in migration

**RULES:**
- Shoes are not allowed on the Giant Map. Please have participants remove shoes before walking on the map.
- Socks should be worn on the Giant Map
- No writing utensils on the Giant Map.
- No sliding on the Giant Map.

**DIRECTIONS:**
Using the list of cities and colored cones, participants will locate the fifteen most populous cities in New Mexico for the years 1910, 1960 and 2010.  They will then look for trends based on the east/west axis and north/south axis, waterways adjacent to and within New Mexico, and defensive settlements from history.  Encourage speculation about the factors that contributed to population development among the various regions of the state.

On the map:
1. Provide participants with an overview about exploring the top fifteen populated places in New Mexico in 1910, 1960, and 2010 using U.S. Census data as a source of information.
2. Ask participants about the kinds of jobs they imagine people were doing in New Mexico in 1910.  Ask them to predict where people might be living and why.
3. Take 15 of the round makers.  Pass them out to 15 of the participants (usually just ask them to take one and pass the remainder along).
4. Read the 15 largest cities one at a time, going down the row of participants and asking the participants to place the marker on the dot identifying the town (star in the case of Santa Fe).
5. Remind the participants that they can provide assistance to their classmates or colleagues about the location of a city based on cardinal directions or the grid. They should avoid shouting "over there", "this way", "left/right", etc. From the beginning of the lesson, model the use of cardinal directions or the grid to describe relative locations of places. Students may use the compass. Place NSEW labels on the walls or around the map.
6. After the flat, round markers are all on the map, ask the participants to interpret the new information that has been added to the map.  Compare this to adding a layer to a geographic information systems map.
7. Before moving on to the subsequent years, have students predict where they might see the most growth and why. Ask participants what jobs people were doing then
8. Pass out the 15 larger cones.  Assign individual participants to place their cones on the 15 cities.  For cities in the top 15 list by population in both 1910 and 1960, have participants pick up the flat marker and place it on top of the cone.

9. After the larger cones are all on the map, repeat Item 6 above, asking participants to think about what has changed and why.
10. Repeat process with 2010 census data and smaller or flexible orange cones. Have participants put the orange cone on top of the flat, round marker creating a pyramid, or on top of the large cone if the city was previously in the top 15 only in 1960.
11. Discuss where most of the people live and why. What areas of the state have no large settlements? Why? This is also an opportunity to review the concentration of people in the state in terms of electoral districts.
12. Predict/discuss how population might change in 2020 Census.

**NOTES:**
Review the Major Eras in New Mexico History for contextual information for the time periods highlighted in this lesson.

**GUIDING QUESTIONS:**

**Q. What factors influence where people settle in New Mexico?**
A. Water, transportation routes, climate, topography, and natural resources have all influenced the patterns of settlement in New Mexico.

According to archaeological records, Native Americans have stewarded the land now known as New Mexico since as far back as 9200 BC. Water seems to have been a key factor in whether or not civilizations thrived and maintained peace. One of the largest and most sophisticated ancient cultures, the Chaco, covered much of northwestern New Mexico, until it was largely wiped out following a change in weather patterns leading to drought. More recent Native America Pueblo societies (understood as the dispersed decedents of the Chaco) were established first on higher ground and then, when water became scarce, alongside major rivers (e.g., Rio Grande, Pecos, Canadian, San Juan, and Gila). These pueblo communities were also agriculturally-based with sophisticated settlements and trade networks. Spanish conquistadores encountered these Pueblos, 19 of which continue to survive on ancestral lands, in the 16th century. Other tribal cultures such as the Navajo (Diné), Ute, three different Apache tribes, and Comanche also lived in, what the Spanish termed, New Mexico.

The Spanish established missions and set up farming communities along the Rio Grande and its tributaries. They established Santa Fe (1610) as their final capital city. The village of Albuquerque was established in 1704. Land grants were offered to develop smaller towns at the edges of the Rio Grande valley in order to provide defense from raiding Plains Indians.

Administration of the New Mexico region was transferred to Mexico following its independence from Spain in 1821. Additional frontier outposts were established through land grants to protect Hispanic settlements against raids and encroachments from foreign governments (e.g., the U.S. and Texas). Hispanic communities continued to push northward.

New Mexico, which included Arizona and part of present-day southern Colorado, officially became a U.S. territory in 1850 following the U.S. war with Mexico. Native Americans and

New Mexicans fought and died over land and resources during this bloody period. See the tribal lands map for current land designations.

Growth has been evident along transportation routes. Hispanic population centers grew along historic trails and wagon roads used for trading. The oldest of these is the El Camino Real Trail, which connected the Spanish cities of Santa Fe and Mexico City from 1598 to 1881. In 1821, the Santa Fe Trail connected the city to Missouri, providing direct trade with and migration from the United States. The railroad arrived in the 1880's and eventually superseded these trails. The railroad brought with it more Anglo[1] farmers, ranchers, adventure seekers, artists, and people suffering from pulmonary illnesses. In the 20th century, north-south (e.g. Route 85/I-25) and east-west (Route 66/I-40) roads and interstate highways superseded the rail routes. Transportation routes combined with the Homestead Act led to an influx of Anglo settlers from Texas and Oklahoma, who established farms and ranches in the eastern and southeastern part of New Mexico. (There was a 67.6 percent increase in New Mexico population during the period from 1900-1910).

Given the arid climate, farming has been a risky business. In New Mexico, it is common to see stream beds running with water only a few months out of the year, and farmers have to syphon this water for irrigation and/or groundwater resources. Wells, storage/irrigation channels (acequias), dams (e.g. Elephant Butte Dam, completed in 1916) and reservoirs are important enablers of growth, as is having legal rights to water.

During and following WWII, New Mexico transitioned into a modern industrial state and began to attract migrants from all over the U.S. Several military bases were established along with defense- and energy-related scientific laboratories. The once-secret Army Corps of Engineers Manhattan Project, and then the U.S. Department of Energy, beckoned hundreds of scientists to the manufactured city of Los Alamos, a place that while not in the top 15 population centers as of 2010, continues to be one of New Mexico's biggest economic drivers. Cities which host/are in proximity to military bases have continued to be some of the largest in the state.

Growth has also centered around the state's enormous store of natural resources. The growth of extractive industries (e.g., silver, copper, uranium and fossil fuels: coal, oil and more recently, natural gas) has led to population growth in certain parts of the state. Towns grew up over silver and uranium mining in the eastern part of the state. Farmington (previously an agricultural supplier for southern Colorado) is a coal supplier in the north and, more recently, a major new store of oil and gas was discovered in the Permian Basin (southeast part of NM and western Texas). The New Mexico Permian discovery occurred after the 2010 Census and will likely be evident in the 2020 Census.

As a border state, New Mexico attracted Mexican miners as well as farm workers, especially during the Bracero period. More recently, since the signing of the NAFTA agreement, Mexican entrepreneurs and business owners have immigrated to New Mexico.

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[1] Historical note: Heavily populated New Mexico became a U.S. territory in 1850 and petitioned to become a state for 60 years. It did not qualify for statehood until enough white settlers arrived.

As with the rest of the United States, New Mexico has seen the redistribution of population from rural areas to cities and suburbs, especially over the last 50 years. The concentration of job opportunities is the key driver of this pattern.

**Q. How many of the fifteen largest cities are located along a river or lake in at each designated time?**
A.

| 1910 | 1960 | 2010 |
|------|------|------|
| 11 | 9 | 12 |

**Q. How many of the biggest cities were in the various regions?  Are they spread evenly or grouped together?**
A. Population has historically been largest through the central part of the state along the Rio Grande valley and in the east along the Pecos River and its tributaries, with additional population centers in the north (e.g. Los Vegas) and west (e.g. Gallup). According to the data covering our three time periods, Albuquerque has had by far the largest population of any other city, yet looking at the pattern of the top 15 cities, we see more these are located in the southern part of the state, and particularly in the southeast.

| 1910 | 1960 | 2010 |
|------|------|------|
| Northwest – 1<br>North Central - 1<br>Northeast - 3<br>Central - 1<br>Southwest -4<br>Southeast - 5 | Northwest - 3<br>North Central - 1<br>Northeast - 1<br>Central - 1<br>Southwest - 1<br>Southeast - 8 | Northwest - 2<br>North Central - 1<br>Northeast - 0<br>Central - 4<br>Southwest - 3<br>Southeast - 5 |

**Q. For what reasons did this pattern exist?**
A.  Major settlements tended to be in flatter areas, near water (in river valleys/flood plains). Places along the railroad lines (which need to be relatively flat) were the fastest growing, and all of the top cities in 1910 were along a rail line. Albuquerque was a major rail headquarters and economic center. Two rail lines intersected the east/southeast connecting the ranching communities of New Mexico to points in Texas and beyond.

By 1960, we see the rails have been displaced by major roads and interstate highways, which have connected most of the top 15 cities of 1910 – including Raton and Las Vegas in the northeast, Gallup in the west and Deming in the southwest. The economic geography of the state had changed, however between 1910 and 1960.

Cities that remain in the top 15 in 2010 include major urban centers with important functions (e.g., Albuquerque and Santa Fe), cities that support a military installation (e.g., Clovis, Alamogordo), and cities that are built around extraction of resources (e.g., Farmington, Carlsbad, Deming, and Hobbs). Another important trend is the growth of the city of Las Cruces and Chaparral, which are all considered to be economically connected to El Paso, Texas.

**Q. How did New Mexico compare with the rest of the United States?**
A.

|  | 1910 | 1960 | 2010 |
|---|---|---|---|
| New Mexico | 327,301 | 951,023 | 2,059,179 |
| United States | 92,228,496 | 179,323,175 | 308,745,538 |

**Q. Where are the largest cities in New Mexico in 1960? How many cities in the new top fifteen in 1960 were also in the top fifteen in 1910? What percentage is that?**
A. See back page for cities in each era.
10 of the new top 15 in 1960 were in the top 15 in 1910.  That is 66%.

**Q. What can account for the changes between 1910 and 1960?**
A.  U.S. culture and industry changed. Albuquerque embraced its economic advantage and grew considerably, while Santa Fe embraced its historical roots and grew much more slowly, while still maintaining its important function as the seat of government. Extraction of resources became even more important (e.g., uranium, coal, and oil) during this time period. New Mexico became an important part of the WWII effort, with the establishment of military bases and defense labs. Agriculture and animal husbandry changed with advances science at the university in Las Cruces, but the drought of the 1930s started pushing people off farms in search of other work.

**Q: Where are the largest cities in New Mexico in 2010?   How many cities in the new top fifteen in 2010 were also in the top fifteen in 1910?  In 1960?**
A. See back page for largest cities in each era.
10 cities (66%) in the new top 15 of 2010 were in the top fifteen in 1960
7 cities (47%) in the new top 15 of 2010 were in the top fifteen in 1910

**Q: What can account for the changes between 1960 and 2010?**
A. The major change is the addition of several new cities that are actually suburbs of Albuquerque and Las Cruces/El Paso.

**Q. Generally speaking, how would you describe the majority of population movement and growth in New Mexico over the past one hundred years?**
A. Generally speaking, population growth has become consolidated in the largest urban center of Albuquerque and the next largest center of Las Cruces. New Mexico continues to attract immigrants from Mexico and maintains a strong connection to Texas in the south. Extractive industries in the southeast will likely continue spurring growth, despite the state's recent commitment to developing renewable resources. In addition, we can look for more growth in northern/north central New Mexico cities (e.g., Santa Fe and surrounding areas) in the 2020 Census.

**Q. Why? What factors have encouraged people to move and live in cities?**
A. Jobs, such as health care, national defense, energy, tourism, the arts, science and technology, and natural resources.  Albuquerque and Las Cruces also host the state's largest public universities. Industry and higher educational institutions are often co-located and mutually reinforcing.

**MODIFICATIONS:**
For younger participants, focus on the map key and compass rose. Consider using props to identify key economic activities on the map, so students can visualize them (e.g. mining, farming, oil).

For older participants, invite them to have more autonomy in the lesson and incorporate additional mathematical concepts. For example, can provide blank list of top 15 cities for 2010 and have participants fill in and/or use lat/long to identify them. You can also assign pairs of participants to track the growth of one city over the three time periods.

**EXTENSIONS:**

Consider using the census data in math lessons. How much larger is Albuquerque today than in 1910? How much larger is Albuquerque than the 15th largest city? How concentrated is the population in Albuquerque over time? How did the population of your city change? How does population change in New Mexico compare to changes in neighboring (Sunbelt) states?

This regional configuration is based on the tourism industry. How else could the state be divided into regions, either based on physical geography, cultural regions, or something else? What areas of the state are not populated and what is the significance of these areas?

For use with the GeoCivics activities (https://www.uccs.edu/geocivics/), invite participants to think about the current configuration of United States Congressional Districts in the state. Ask them to remember the key characteristics of how districts are drawn (equal population and contiguous). Invite them to pretend that their state has just two Congressional Districts; ask two people to pick up one of the chains and divide the state generally in half by population; invite two more people to divide the state into four districts (they may choose to move the original chain, or not). Discuss why some districts would likely be smaller in area than others. If appropriate, determine how to divide the state into state senate districts.

Consider when a giant floor map is a good tool for understanding geographic phenomena and when other tools (paper maps, online maps) might be more appropriate.

**NOTE:**
Thanks to National Geographic's Giant Traveling Maps team for the inspiration for this lesson, which is based on "People on the Move", a lesson for the North America Giant Map.

**RESOURCES:**

New Mexico State Standards: https://webnew.ped.state.nm.us/bureaus/instructional-materials/new-mexico-content-standards/

Major Rivers and Towns: https://www.citytowninfo.com/places/new-mexico/map
Historic Railroad Atlas (AZ & NM):
https://trains.rockycrater.org/graphics/pfmsig/atlas48/az-nm-1948.jpg

Regions: https://www.newmexico.org/places-to-visit/regions/

Map of Tribal Territories: https://www.env.nm.gov/general/map-of-new-mexico-tribal-territory/

Map of State, Federal and Tribal Lands:
https://nationalmap.gov/small_scale/printable/images/pdf/fedlands/NM.pdf

Map of agricultural areas: http://www.dreamingnewmexico.org/food/ff-crops

New Mexico topography: https://edac.unm.edu/wordpress/wp-content/uploads/2008/06/nmreliefbig.jpg

Historic Trails of New Mexico: https://www.abqjournal.com/643310/human-highways.html

New Mexico state highway/major road map:
http://www.statemapsonline.com/images/maps/new-mexico/New-Mexico-State-Highway-Road-Map.jpg

Maps showing Permian Basin geology and provinces:
https://www.britannica.com/place/Permian-Basin/media/1/452277/94328

Precipitation and Climate Graphs for cities in New Mexico:
https://www.usclimatedata.com/climate/new-mexico/united-states/3201

| | City | 1910[2] | Lat/Long[3] | | City | 1960[4] | Lat/Long | | City | 2010[5] | Lat/Long |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | State | 327,301 | | | State | 951,023 | | | State | 2,059,179 | |
| 1 | Albuquerque | 11,020 | 35.0°N, -106.6°W | 1 | Albuquerque | 201,189 | 35.0 N, -106.6°W | 1 | Albuquerque city | 545,852 | 35.0°N, -106.6°W |
| 2 | Roswell | 6,172 | 33.9°N, -104.5°W | 2 | Roswell | 39,593 | 33.9°N, -104.5°W | 2 | Las Cruces city | 97,618 | 32.3°N, -106.7°W |
| 3 | Santa Fe | 5,072 | 35.6°N, -105.9°W | 3 | Santa Fe | 34,394 | 35.6°N, -105.9°W | 3 | Rio Rancho city | 87,521 | 35.2°N, -106.6°W |
| 4 | Raton | 4,539 | 36.9°N, -104.4°W | 4 | Las Cruces | 29,387 | 32.3°N, -106.7°W | 4 | Santa Fe city | 67,947 | 35.6°N, -105.9°W |
| 5 | Las Cruces | 3,836 | 32.3°N, -106.7°W | 5 | Hobbs | 26,275 | 32.7°N, -103.1°W | 5 | Roswell city | 48,366 | 33.9°N, -104.5°W |
| 6 | Las Vegas | 3,755 | 35.5°N, -105.2°W | 6 | Carlsbad | 25,541 | 32.4°N, -104.2°W | 6 | Farmington city | 45,877 | 36.7°N, -108.1°W |
| 7 | Clovis | 3,255 | 34.4°N, -103.2°W | 7 | Farmington | 23,786 | 36.7°N, -108.1°W | 7 | South Valley (CDP) | 40,976 | 35.0°N, -106.6°W |
| 8 | Silver City | 3,217 | 32.7°N, -108.8°W | 8 | Clovis | 23,713 | 34.4°N, -103.2°W | 8 | Clovis city | 37,775 | 34.4°N, -103.2°W |
| 9 | Alamogordo | 2,315 | 32.9°N, -105.9°W | 9 | Alamogordo | 21,723 | 32.9°N, -105.9°W | 9 | Hobbs city | 34,122 | 32.7°N, -103.1°W |
| 10 | Tucumcari | 2,526 | 35.1°N, -103.7°W | 10 | Gallup | 14,089 | 35.5°N, -108.7°W | 10 | Alamogordo city | 30,403 | 32.9°N, -105.9°W |
| 11 | Gallup | 2,204 | 35.5°N, -108.7°W | 11 | Artesia | 12,000 | 32.8°N, -104.4°W | 11 | Carlsbad city | 26,138 | 32.4°N, -104.2°W |
| 12 | Artesia | 1,883 | 32.8°N, -104.4°W | 12 | Grants | 10,274 | 35.1°N, -107.8°W | 12 | Gallup city | 21,678 | 35.5°N, -108.7°W |
| 13 | Deming | 1,804 | 32.2°N, -107.7°W | 13 | Portales | 9,695 | 34.1°N, -103.3°W | 13 | Deming city | 14,855 | 32.2°N, -107.7°W |
| 14 | Carlsbad | 1,736 | 32.4°N, -104.2°W | 14 | Lovington | 9,660 | 32.9°N, -103.3°W | 14 | Los Lunas village | 14,835 | 34.8°N, -106.7°W |
| 15 | Socorro | 1,560 | 34.0°N, -106.8°W | 15 | Raton | 8,146 | 36.9°N, -104.4°W | 15 | Chaparral (CDP) | 14,631 | 32.0°N, -106.3°W |

[2] Source: US Census, 1910 Decennial Census, vol. 3, ch.2, p.186 Incorporated Places (with exception of Alamogordo, which was not yet incorporated).
[3] The NG Giant Map includes lines of latitude and longitude in decimal degrees. They are listed here for reference if using this map. Note: in decimal degree notation, all longitude coordinates west of the Prime Meridian (0°) are negative, and all latitude coordinates south of the Equator (0°) are also negative.
[4] Source: US Census, 1960 Census of Population and Housing (vol.1, p.33, ch.2)
[5] Source: US Census, 2010 New Mexico Population and Housing Counts, Table 10: Rank by 2010 Population and Housing Units (p. 36)

| | City | 2020* | √ |
|---|---|---|---|
| | **State** | **2,117,522** | |
| 1 | Albuquerque | 564559 | 35.0˚N, -106.6˚W |
| 2 | Las Cruces | 111385 | 32.3˚N, -106.7˚W |
| 3 | Rio Rancho | 104046 | 35.2˚N, -106.6˚W |
| 4 | Santa Fe | 87505 | 35.6˚N, -105.9˚W |
| 5 | Roswell | 48422 | 33.9˚N, -104.5˚W |
| 6 | Farmington | 46624 | 36.7˚N, -108.1˚W |
| 7 | Hobbs | 40508 | 32.7˚N, -103.1˚W |
| 8 | Clovis | 38567 | 34.4˚N, -103.2˚W |
| 9 | South Valley | 38338 | 35.0˚N, -106.6˚W |
| 10 | Carlsbad | 32238 | 32.4˚N, -104.2˚W |
| 11 | Alamogordo | 30898 | 32.9˚N, -105.9˚W |
| 12 | Gallup | 21899 | 35.5˚N, -108.7˚W |
| 13 | Los Lunas | 17242 | 34.8˚N, -106.7˚W |
| 14 | Sunland Park | 16702 | 31.8˚N, -106.6˚W |
| 15 | Chaparral | 16551 | 32.0˚N, -106.3˚W |

*2020 Census data is from Redistricting Data Hub using the State and Place level PL 94-171 datasets.
https://redistrictingdatahub.org/data/download-data/#state-menu