

Arizona Population Changes as a Result of the Mining Industry

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Grade Level 4
Duration 2 class periods

National Standards

GEOGRAPHY

Element 1: The World in Spatial Terms

1. How to use maps and other geographic representations, geospatial technologies, and spatial thinking to understand and communicate information

Element 2: Places and Regions

4. The physical and human characteristics of places

Element 4: Human Systems

9. The characteristics, distribution and migration of human populations on Earth's surface

Element 5: Environment and Society

14. How human actions modify the physical environment

16. The changes that occur in the meaning, use, distribution, and importance of resources

AZ Standards

MATHEMATICS

Measurement and Data

4.MD.A.2. Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

Mathematical Practices

4.MP.2. Reason abstractly and quantitatively.

Arizona Social Science Standards

GEOGRAPHY

The use of geographic representations and tools help individuals understand their world.

4.G1.1 Use and construct maps and graphs to represent changes in the Americas over time.

Human-environment interactions are essential aspects of human life in all societies.

4.G2.1 Compare the diverse ways people or groups of people have impacted, modified, or adapted to the environment of the Americas.

Examining human population and movement helps individuals understand past, present, and future conditions on Earth's surface.

4.G3.1 Explain how the location and use of resources affects human settlement and movement.

Global interconnections and spatial patterns are a necessary part of geographic reasoning.

4.G4.1 Explain the positive and negative effects of increasing economic interdependence on distinct groups, countries, and new settlements.

Overview

Our changing use of natural resources can affect human migration. Mining in Arizona had this impact. Towns would boom and then towns went bust. Students should realize that natural resources and resulting employment or unemployment can affect human migration.

Purpose

In this lesson students will gain a better understanding of how migration patterns of miners

reflected the demand for the mineral mined. Towns grew and towns died depending on the price of the ore or the availability of the mineral.

Materials

- Mining Ore Not reading
- What's at the end of the road? worksheet and Answer Key
- Arizona distance chart and Answer Key
- Paper, pencil, colored pencils, markers, crayons, rulers
- Arizona Mining Presentation (PowerPoint)

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- Mining Ore Not: Arizona Mining Towns map https://geoalliance.asu.edu/sites/default/files/maps/AZ_Mining_Towns.pdf

Objectives

The student will be able to:

1. Measure the distance from one town to another town using a map scale.
2. Read a chart and complete a chart.
3. Speculate as to which major Arizona cities were reasonably close for miners to migrate after they were displaced due to mine closures.
4. Explain how the changes in our use of natural resources impacts human migration.

Procedures

SESSION ONE

1. Draw a KWL chart on the whiteboard and distribute notebook paper to students for their version of the KWL chart. Ask what the students know about Arizona mining especially the mining of copper. Record their knowledge on the whiteboard and have students copy this on their KWL chart.
2. Ask students what they would like to know more about mining in Arizona. Record this on the KWL chart and have the students write this on their chart.
3. Project the Arizona Mining Presentation. Discuss the images of copper and the mining industry and add to the what I have learned column of the KWL chart.
4. Project the Mining Ore Not: Arizona Mining Towns map. Discuss the cities that are mining towns and those that are not. Where were most of the mines found? (western and southern AZ) Which of these towns have they heard of today? (Phoenix, Tucson, Flagstaff, etc.) Were these mining towns?
5. Distribute and project the Mining Ore Not reading. Have students read the information. Again, add to the what I have learned section of the KWL chart. Collect the KWL charts from the students.

SESSION TWO

1. Distribute the What's at the end of the road? Worksheet, the Mining Ore Not: Arizona Mining Towns map, rulers, and the Arizona Distance Chart. Explain the directions to Part One. Then have students work in groups to measure distances between towns and major cities in Arizona that were **not filled in** on the worksheet.

Model how to measure the distance with the first one.

2. When the students have completed Part One of the worksheet, have them organize the data for their zone maps by using the "Closest City" column (for instance, all Phoenix cities or all Tucson cities).
3. Have students mark the migration group cities (the organized data) on the map color coded by city. For example, all of the cities that are demographically closest to Phoenix might be circled, marked with an "X," or highlighted in blue. Then the students will create "zones" of possible migration by encompassing all the cities of the same color into a "zone." Model for the students.
4. Have the students complete Part Two of the worksheet.

Assessment

Mathematics

Students' ability to measure distance can be assessed using the Arizona Distance Chart. Allow an error of 20 miles in measuring. Mastery will be considered 23 points or higher out of the 29 measurements.

Geography

Part Two of the student worksheet can be graded for mastery of the geographic concepts. Allow 4 pts. for questions #1, 2 pts. for question #2, and 4 pts. for question #3. There is a total of 10 points with 8 points considered mastery.

The Arizona Distance Chart can be graded for accuracy in determining the Closest City. Mastery will be considered at least 23 correct answers out of the 29 possible.

Extensions

Students can use the metric key to measure distance and begin to describe the relationship between metric and standard measurements.

Have students create a rule or formula that would allow them to convert any inch or centimeter measurement to a mile or kilometer distance.

Have students research the current Arizona mines. How many people do they employ? Where are they located? What is mined?

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Sources

A special thanks to Kay McClain, Vanderbilt University

Data and history sources:

<http://www.azgs.az.gov/>

Center of the American West

<http://www.centerwest.org/futures/>

Arizona Mining Association

<https://azmining.com/>

Copper Mining in Arizona

https://en.wikipedia.org/wiki/Copper_mining_in_Arizona