

MINERALS THROUGH GEOGRAPHY

STANDARDS

See summary of National Science Education Standards.

Original: <http://books.nap.edu/readingroom/books/nses/>

Standard Concept	General Standard	Specific Standard	General Standard	Specific Standard	General Standard	Specific Standard
Grade level		K-4		5-8		9-12
Science in ... social perspective (F)	Characteristics and changes in population	F.2.4.1	Populations, resources, and environment	F.2.8.2		
	Types of resources	F.3.4.1			Natural Resources	F.3.12.1
		F.3.4.2				
		F.3.4.3				
	... technology in local challenges	F.5.4.2				



MINERALS THROUGH GEOGRAPHY

INTRODUCTION

Minerals are related to rock type, not political definition of place. So, the minerals are to be found in a variety of locations that doesn't depend on population or other political geographical constraints. However, political boundaries determine many steps in the use of minerals.

OBJECTIVE:

Students will locate spots where specific minerals are found on a US map.

MATERIALS REQUIRED:

- Maps (laminated if possible). See the Women in Mining website, Teacher Tools: <http://www.womeninmining.org> . Educators will have to download the map to a CD or Memory Stick, print out the authorization letter and take this to a copy place that can do 11 x 17 printing in color. We recommend you laminate the copies before using them in the classroom.
- A pair of dice for each group
- Small game pieces or markers. I use the Hershey's Kissables
- Worksheet for each student
- Trip cards for each trip (card stock, business card size)

ACTIVITY:

PROCEDURE (Teacher instructions)

- 1) Set up
 - a) Divide the students into groups of 6 or less. Each member will operate independently in the group, but overall winner is by group.
 - b) Have each student roll the dice twice to locate a home city.
 - c) Using the Home City chart, match the number from the first roll to the corresponding horizontal axis, and the second number with the vertical line. Where these numbers bisect will be that student's Home City. Students must remember to start and end the game at their Home City.
 - d) After the students all have their Home City, they will draw a trip card. Give the students several minutes to determine the best route for their trip and enter their first and alternate routes on their worksheet.
- 2) Students will travel by dice movement, using their marker, across the United States to a state the produces a mineral on their trip card. They must reach the state capital in order to capture that state's mineral. Once a state has been taken, no one else can use it. Students need to plan their trips carefully, with back-up routes available. Minerals do not need to be retrieved in the same order as is shown on the trip card.
- 3) Roll the dice to determine starting student. Students with the lowest numbers start first.
- 4) The winning student in each group retrieves the five state cards from his or her trip and returns to his or her Home City first. The game can continue to see which group can finish first.
- 5) A worksheet is provided to help students plan and keep track of their trips.

EVALUATION:

- 1) What conclusions can be drawn about the occurrence of minerals?
 - a) Do the students understand that states may have mineral resources that vary from state to state?
- 2) Have the students research the states on their trip card and find out what other mineral resources are mined there.
- 3) Have the student's research industries in the various states. Is there a relationship between a states's other industries and its mineral resources?
 - a) Do mineral resources in surrounding states play a role in a particular industry in a particular state?
- 4) Have students pick various careers and determine which state would more likely have an industry that would use that particular career.



- a) Would the availability of specific career choices be determined by which state a student would like to live in to pursue that career?



HOME CITIES						
Roll of first die→	1	2	3	4	5	6
Roll of second die↓						
1	Casper, WY	Baltimore, MD	San Diego, CA	Wichita, KS	Jamestown, ND	Cedar Rapids, IA
2	Lubbock, TX	Socorro, NM	Macon, GA	Omaha, NE	Missoula, MT	Ft. Wayne, IN
3	Springfield MO	Tonopah, NV	Milwaukee, WI	Anchorage, AK	Ontario, OR	Pueblo, CO
4	Mobile AL	Portland, ME	Peoria, IL	Akron, OH	Hawi, HI	Jacksonville, FL
5	Pittsburgh, PA	Louisville, KY	Pocatello, ID	Tulsa, OK	Roanoke, VA	Bridgeport, CT
6	Rochester, NY	Knoxville, TN	Seattle, WA	New Orleans, LA	Greensboro, NC	Manchester, NH

MINERALS TO COLLECT ON TRIPS					
Trip 1	Barite	Copper	Lead	Petroleum	Soapstone
Trip 2	Beryl	Diamonds	Limestone	Phosphate	Sulfur
Trip 3	Beryllium	Fluorspar	Lithium	Platinum	Taconite
Trip 4	Boron	Gold	Magnesium	Potash	Talc
Trip 5	Clay	Granite	Marble	Pyrite	Trona
Trip 6	Clay	Graphite	Mica	Salt	Tungsten
Trip 7	Clay	Gypsum	Molybdenum	Sandstone	Uranium
Trip 8	Coal	Helium	Natural Gas	Sand/Gravel	Vanadium
Trip 9	Coal	Iron Ore	Nickel	Silver	Zinc
Trip 10	Coal	Lead	Olivine	Slate	Zinc



STATES AND MINERALS			
Alabama	Iron ore	Montana	Tungsten
Alaska	Zinc	Nebraska	Petroleum
Arizona	Copper	Nevada	Gold
Arkansas	Diamonds	New Hampshire	Beryl
California	Boron	New Jersey	Zinc
Colorado	Molybdenum	New Mexico	Potash
Connecticut	Mica	New York	Talc
Delaware	Magnesium	N. Carolina	Lithium
Florida	Phosphate	North Dakota	Uranium
Georgia	Barite	Ohio	Sandstone
Hawaii	Clay	Oklahoma	Helium
Idaho	Silver	Oregon	Nickel
Illinois	Fluorspar	Pennsylvania	Slate
Indiana	Limestone	Rhode Island	Sand/Gravel
Iowa	Gypsum	S. Carolina	Clay
Kansas	Salt	South Dakota	Vanadium
Kentucky	Coal	Tennessee	Pyrite
Louisiana	Sulfur	Texas	Graphite
Maine	Clay	Utah	Beryllium
Maryland	Coal	Vermont	Marble
Massachusetts	Granite	Michigan	Platinum
Virginia	Soapstone	Washington	Olivine
Minnesota	Taconite	West Virginia	Coal
Mississippi	Natural Gas	Wisconsin	Lead
Missouri	Lead	Wyoming	Trona

The map of the United States can be found at <http://www.womeninmining.org/pdfs/GeographyMap.pdf> .
The map should be printed out on 11”X17” paper to use as the playing board.



Minerals through Geography			
Worksheet			
Trip No. _____			
Home City _____	Marker Color _____		
Route (POSSIBLE state to go to)	# - or - order of states to go to	Mineral Mined in the State	State Captured (check mark)
1)			
1)			
1)			
1)			
1)			
alternate:			
alternate:			



To Whom It May Concern:

This is authorization for the holder of this letter to reproduce the “Minerals Through Geography” activity and map for educational purposes only.

Arloa Woolford
President
Women In Mining Education Foundation

