

## A MINE IN THE MAKING:

Exploring for and developing useful earth resources using topographic and geologic maps as a source of information.

### 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 as inquiry (A)	Abilities ... to do ... inquiry	A.1.4.1	Abilities ... to do ... inquiry	A.1.8.3	Abilities ... to do ... inquiry	A.1.12.5
	Understandings about ... inquiry	A.2.4.1	Understandings about ... inquiry	A.2.8.1	Understandings about ... inquiry	A.2.12.1
		A.2.4.2				A.2.12.2
Earth Science (D)	Properties of Earth Materials	D.1.4.1	Structure of Earth system	D.1.8.4		
Science in ... Social Perspectives (F)			Personal Health	F.1.8.7		
	Types of Resources	F.3.4.1			Natural resources	F.3.12.1
		F.3.4.2				F.3.12.2
		F.3.4.3				
			Risks and Benefits	F.4.8.1		
				F.4.8.4		
	Science and Technology in Local Challenges	F.5.4.1	Science and Technology in society	F.5.8.1		
		F.5.4.2		F.5.8.3		



				F.5.8.4		
				F.5.8.5		
					Science and technology in local, national, and global challenges	F.6.12.1
						F.6.12.2



## A MINE IN THE MAKING:

### INTRODUCTION

Maps summarize information about land forms, composition, and use. These resources can be used to make decisions about possible development, in this case, a possible mine.

### OBJECTIVES

Consider the possibility of developing mineral resources found in the Frenchman Mountain map area. Apply the information on the topographic and geologic maps of the Frenchman Mountain quadrangle plus other resources to decide if it might be possible to open a mine.

### MATERIALS:

- Topographic map of area of interest
- Geologic map of the same area
- Cross-section (topographic and geologic) of that same area
- Land status map of the area
- Examples of rocks found in the map area, if available

PROCEDURE AND EVALUATION QUESTIONS (student directions, possible answers in italics):

- 1) Study the maps, cross sections, and consider the Earth resources of the area. Develop questions about the development of Earth resources for use.
  - a) What factors would bear on your decision of whether or not it would be worthwhile to develop and use any of the rocks and minerals found here?
  - b) What kinds of rocks and/or minerals are present, in general in the Frenchman Mountain map area?
    - i) (*Limestone, sandstone, shale, gneiss, schist...others?*)
    - ii) Of what economic or commercial use might these rocks be?
  - c) Look at samples of the rocks found in the area.
    - i) Brainstorm uses.
    - ii) Do Internet research on possible uses of the rocks that might be found in this map area.
    - iii) Explore USGS CD "Minerals in your World" Minerals Information Institute website.
  - d) Are there local markets for these materials?
- 2) If you decide that there are useful, desirable, marketable, rocks and or minerals present in the area that you would like to develop, what factors would you then have to consider and investigate?
  - a) Supply and demand:
    - i) Is there an adequate accessible supply of the rock/mineral?
    - ii) Is there a demand for it?
  - b) Legality issues:
    - i) Is mining allowed here?



- ii) How can you find out if mining is permitted here?
  - iii) What about land status? (*Consult a land status map*)
  - iv) On what categories of land can resources be developed?
  - v) What is the “highest and best use of the land” – what are some classifications of land use?
    - (1) *Residential*
    - (2) *Commercial*
    - (3) *Recreational*
    - (4) *Agricultural*
    - (5) *Industrial*
    - (6) *other?*
  - vi) Who has jurisdiction over land use?
    - (1) *Cities*
    - (2) *Counties*
    - (3) *Federal*
    - (4) *State*
    - (5) *Private*
    - (6) *other?*
- 3) If you find that mining is allowed in the area you want to develop, what kinds of rules and regulations do you think there might be regarding development of natural resources on this land?
- a) What factors would you expect such regulations to address?
  - b) Public safety and health
    - i) Air pollution
    - ii) Water pollution/surface/ground
    - iii) Noise and visual impact; “viewscape”
    - iv) Native plant and animal protection
    - v) Historical and cultural resource protection
    - vi) Road access
    - vii) Proximity to residential land
    - viii) Other?
  - c) How/where would one find this information?

## TEACHER NOTES

If possible, use a topographic map for an area of which students have some knowledge or experience. The Frenchman Mountain Quadrangle of Nevada is used here as an example.

## RESOURCES

- 1) United States Geological Survey, Mineral Information Institute, American Coal Foundation *"Minerals in Your World"* (CD)
- 2) NDOM website online Document *"State and Federal Permits Required in Nevada Before Mining or Milling Can Begin"* at [http://minerals.state.nv.us/forms/miscmining/SPL6\\_200302.pdf](http://minerals.state.nv.us/forms/miscmining/SPL6_200302.pdf)
- 3) NBMG website online document *"Mining Claim Procedures for Nevada Prospectors and Miners"* at <http://www.nbmgs.unr.edu/dox/sp6.pdf>



- 4) Nevada Bureau of Land Management: <http://www.nv.blm.gov>
  - a) Land status maps for areas in Nevada are generally available from the U.S. Bureau of Land Management at this website.

