Lesson Plan Outline
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Unit 2: Rocks and Minerals

Lesson 1: What are Minerals 2-1

Objective: Students will express an understanding of the properties of minerals.

Materials:

- Overhead 2-1
- ESRT
- Workbook

Vocabulary:

Atom: The smallest part of an element
Elements: Substance made up of only one kind of atom.
Crystal: A solid geometric form of mineral produced by repeating patterns.
Mineral: A naturally formed inorganic solid with a crystalline structure.

Presentation:

Do Now: Define Vocabulary
Homework Check – Review
Lecture

Some minerals look like gems and others look just like rocks. Minerals can be identified. Minerals are substances that are made up of substances that are non-living and have never been alive. A mineral CANNOT be organic. Minerals are single solid elements in the Earth's crust. Minerals have five main features. All minerals in the Earth's crust are made up of elements and compounds. Most of the Earth's crust is made up of the elements oxygen and silicon. Minerals are natural solids formed from elements in the Earth's crust. Minerals are composed of one or more chemical elements. Most rock forming minerals are made from compounds. Minerals are naturally solid, occurring chemical elements or compounds that are homogenous, meaning they have a definite chemical composition and a very regular arrangement of atoms.

Evaluation: Students will express an understanding of minerals are through discussion.

Homework: Read & write reaction to article "Mining Brings Opportunities and Challenges" http://www.blm.gov.education/00_resources/articles/mining/

State standards:

Standard 2: Information Systems
Key Idea 1& 3
Standard 6: Interconnectedness: Common Themes
Key Idea 6
Standard 7: Interdisciplinary Solving Problems Connections
Key Idea 1

Vocabulary: (define)

Atom	Crystal
Element	Mineral

- Some minerals look like gems and others look just like rocks.
- Minerals can be identified.
- Minerals are substances that are made up of substances that are non-living and have never been alive. A mineral CANNOT be organic.
- Minerals are single solid elements in the Earth's crust. Minerals have five main features

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- Minerals are natural solids formed from elements in the Earth's crust.
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UNIT 2: Rocks & Minerals

Lesson 2: Where do we get minerals?

Objective: Students will express an understanding of the means of one method of mining of minerals.

Materials:
Overhead 3-3a
Projector
PowerPoint: Where did that penny come from?

Vocabulary:
Adat: opening to a mine in the side of a mountain.

Presentation:

Do Now: Define Vocabulary

Homework Check – Review

Lecture

According to the U.S. Bureau of Mines, it is estimated that Americans consume 4.5 billions metric tons of minerals each year. This figure includes 3.2 metric tons of coal used for electricity production.

The computers in this classroom contain, quartz for the timing devices, silicon for processing, gold, silver and copper for their wiring. The lists of mineral uses are huge; insulators, television screens, speakers in your radio. Mined minerals play a role in just about every thing in your life.

Evaluation: Students will express an understanding of the means of one method of mining of minerals through active classroom discussion.

Homework:
List at least ten items in your home that has materials that were mined.

State standards:
Standard 2: Information Systems
Key Idea 1:
Key Idea 3:
Standard 6: Interconnectedness: Common Themes
Key Idea 6
Standard 7: Interdisciplinary Solving Problems Connections
Key Idea 1:

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UNIT 2: Rocks & Minerals

Lesson 3: What are other ways of getting minerals?

Objective: Students will express an understanding of the means other methods of mining of minerals.

Materials:
Computer Lab
http://geology.asu.edu/resources/virtual-trips/

Vocabulary:

Presentation:

Do Now: Define Vocabulary
Homework Check – Review
Lecture
Mining takes many forms. One way of extracting ore is

Evaluation: Students will express an understanding of the means of one method of mining of minerals through active classroom discussion.

Homework:
Compare and contrast underground mining and open pit mining.

State standards:
Standard 2: Information Systems
Key Idea 1:
Key Idea 3:
Standard 6: Interconnectedness: Common Themes
Key Idea 5:
Key Idea 6
Standard 7: Interdisciplinary Solving Problems Connections
Key Idea 1:

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UNIT 2: Rocks & Minerals

Lesson 4: What do you do when you've gotten your minerals?

Objective: Students will express an understanding of the means reclaiming lands from spent mines.

Materials:
Computer Lab
http://www.blm.gov/education/00_resources/srticles/mining/

Vocabulary:

Presentation:

Do Now: Define Vocabulary
Homework Check – Review
Lecture
Mining takes many forms. One way of extracting ore is

Evaluation: Students will express an understanding of the means reclaiming lands from spent mines by constructing a model of land reclaimation.

Homework:
Compare and contrast underground mining and open pit mining.

State standards:
Standard 1: Analysis, Inquiry and Design
Mathematical Analysis - Key Idea 1:
Engineering Design – Key Idea 1:
Standard 2: Information Systems
Key Idea 1:
Key Idea 3:
Standard 6: Interconnectedness: Common Themes
Key Idea 5:
Key Idea 6
Standard 7: Interdisciplinary Solving Problems Connections
Key Idea 1:

Name: _____ Date: _____
Land Reclamation

During this exercise, you are playing the role of a mining executive that wants to close the mine. You can't leave adits or shafts or open pits behind so you must come up with a plan to recover the land.
Using the list of mines, pick one and deside on a plan that would best suit the mine reclamation.

1. What type of mine did you have? _____

2. Describe the environment the mine was in. _____

   _____

   _____

   _____

3. List some of the problems you must overcome to complete your project.

   _____

   _____

   _____

   _____

   _____

   _____

4. What do you see your land use to be when you've completed the project?

   _____

   _____

   _____

   _____

5. On a typed completed paper, describe how you would implement your plan. Include information in the above paragraphs. If you have a pit mine, use a topographic map that you've chosen, draw a profile of the mine, and a profile of your proposed plan. Underground mines must include sealing of adits and removal of accessory buildings.