

Is it grown or mined?

This lesson is intended as an introduction to mineral identification for grades 10 – 12 but it could be modified for lower grades.

Objectives:

- 1) Students will distinguish between raw materials that are grown and those that are mined.
- 2) Students will evaluate their attitudes toward mining.
- 3) Students will identify 8 ore minerals and the elements that are obtained from them.

National Science Standards:

Content Standard B: Structure and properties of matter

Content Standard D: Geochemical cycles

Content Standard E: Understandings about science and technology

Content Standard F: Natural resources

Content Standard G: Science as a human endeavor

Materials: Common products to use as examples of mineral uses.

Aluminum foil

Baby powder

Salt

Cosmetics (eye shadow, blush, face powder, lipstick)

Baking soda

Jewelry

Procedures:

Day 1

1. Students will be divided into groups of four and instructed to:
 - a) Each person will choose one material possession they would keep if they could only keep one thing.
 - b) They will discuss their choices with their group.
 - c) Then, with help from others in the group, they will list the raw materials used for that item. **(10 minutes)**
2. After the lists have been made:
 - a) The students will report their choices to the rest of the class.

- b) I will start a list on the board of the items, raw materials, and the source (mine or farm) of the raw materials.
- c) Class members will be given the opportunity to add to the list of raw materials.
- d) The class will be challenged to find any material that is neither grown nor mined. **(15 minutes)**

5. The students will be asked:

- a) What do you know about mining?
Most don't know very much but will have opinions, probably negative
- b) Why do we mine?
- c) Is it necessary to mine?
- d) Do you know where there is a mine?
Someone should mention the 3M quarry or other quarries, old bauxite mines, historic silver mine in North Little Rock, coal mines around Fort Smith, Malvern Minerals, current and historic mines at Magnet Cove, Stracor at Hot Springs, brick clays at Malvern
- e) Have you ever seen a mine? *Most have seen the local quarries*
- f) What do we call the materials we extract from mines? *ore minerals, rocks*
- g) How do we get the minerals out of the mine?
Discuss underground, open pit, and strip mines
- h) What are some of the common materials that come from mines?
Lead, copper, zinc, iron, aluminum, diamonds, gold, silver
- i) What are the two sources of raw materials? **(20 minutes)**
A mine or a farm

Activity:

1. The students will be shown examples of ores of the elements listed above (h) without being told which element is obtained from each. They may use the classroom library or the computer lab to determine the name of each ore and the element that is obtained from it. **(30 minutes)**
2. The students will use a prepared worksheet to record their identifications.
3. When the time is up the papers will be collected
4. The class will receive feedback by discussing the identifications they made and the uses for each element. **(15 minutes)**

Assessment:

Diagnostic assessment: Lists of raw materials and their sources, statements of changes of opinion toward mining, recognition of the fact that all raw materials must be grown or mined.

Formative assessment: Lab sheets will be collected and scored.

Summative assessment: Projects will be assigned and presented to the class at a later time, approximately two weeks.

Extensions:

Students will select from this list or design a project of their own. (work in groups of 2 or 3)

1. Research and report on the mining history of Arkansas, report to the class.
2. Interview a person who works or has worked in the mining industry; produce a video of the interview.
3. Do a photo-essay of reclaimed and active mines, produce a poster.
4. Research the safety records of modern mining, report to the class.
5. Research the laws regarding reclamation, report to the class.
6. Make a survey of minerals used in cosmetics by checking the ingredient list on cosmetic packages, produce a poster.
7. Make a survey of minerals used in food products, report to the class.
8. Survey the use of minerals in medicine, produce a poster.