

Mineral Scavenger Hunt

1. CONTRIBUTOR'S NAME: Johnny MacLean

2. NAME OF INQUIRY: Mineral Scavenger Hunt

3. GOALS AND OBJECTIVES:

a. Inquiry Questions: What daily objects do you use every day that come from minerals? What are some objects in the classroom that come from minerals? What minerals did these objects come from?

b. Ecological Theme(s): Minerals are the building blocks of rocks. Rocks and their associated tectonic setting provide the broad framework for ecosystems and habitats.

c. General Goal: The goal is for students to recognize that different minerals are used to make all inorganic objects and products that we use in our daily lives.

d. Specific Objectives:

Academic: Students learn about different minerals, mineral classification, mineral properties, and how minerals are used in every inorganic item in our industrialized society.

Experimental: students learn basic mineral identification techniques; students use charts for comparison.

Social: Students work in groups.

e. Grade Level: 5th or older (unless scaled down)

f. Duration/Time Required:

→ Prep time: 30 minutes

→ Implementing Exercise During Class: 1 hour

→ Assessment: 30 minutes

4. ECOLOGICAL AND SCIENCE CONTEXT:

Background (for Teachers and Students):

Minerals are everywhere. Every inorganic object we see, both natural and human-made, comes from minerals. Minerals form rocks, which make up the framework for habitats and ecosystems.

5. MOTIVATION AND INCENTIVE FOR LEARNING:

Kids get to play with minerals. Kids get to discover that “human-made” objects come from natural sources.

6. VOCABULARY:

- Minerals—inorganic, naturally occurring substances that have a characteristic chemical composition, distinctive physical properties, and crystalline structure. Most mineral crystals occur in rocks, aggregates of one or more minerals. Minerals are characterized by several properties:

- Color—the most noticeable property. However, some minerals can occur in a variety of colors, so identification should also be based on other mineral properties.

- Crystal Form—the geometric shape of a crystal if it is allowed to grow in an unrestricted environment. Most crystals grow in a crowded environment, so their crystal form is not seen (like in most rocks).

- Hardness—Hardness is a measure of a mineral’s resistance to scratching. There is a hardness scale for measuring relative hardness:

- 10) Diamond
- 9) Corundum
- 8) Topaz
- 7) Quartz
- 6) Feldspar
- 5) Apatite
- 4) Fluorite
- 3) Calcite
- 2) Gypsum
- 1) Talc

- Other mineral properties—specific gravity, cleavage, fracture, tenacity, magnetism, etc.
- Luster—how mineral surfaces reflect light, such as metallic luster or nonmetallic luster.
- Streak—the color of a mineral after it has been powdered on a surface such as concrete or unglazed porcelain.

7. SAFETY INFORMATION:

Make sure minerals and identification tools are used in a safe and orderly manner.

8. MATERIALS LIST (including any handouts or transparency masters):

- If available, samples (or at least pictures of samples) of minerals that make up common objects should be displayed for the students in order to provide a visual and physical connection for the students.

- Mineral/Uses/Object Chart
- Normal classroom and household objects

9. METHODS/PROCEDURE FOR STUDENTS:

a. Pre-investigation work: The teacher should ask the students where various objects in the classroom or at home come from. The teacher should lead a discussion of minerals, where minerals come from, the difference between natural objects and human-made objects, etc.

b. Investigation work:

1) *What evidence (data, samples) do students collect?* Students should investigate the samples of the minerals. They should then use their Mineral/Uses/Object Chart to find classroom and household items that were made from the minerals listed in the chart. They should try to find at least one item that was made from every mineral on the chart.

2) *How do students present the evidence (data)?* Their results should be recorded in the “Object” column of the chart.

3) *What conclusions are drawn from the evidence students collect?* Students should conclude that human-made objects are derived from naturally occurring minerals.

10. ASSESSMENT: Students are assessed by their ability to find classroom/household objects that were derived from naturally occurring minerals. The objects and minerals should be appropriately matched.

11. EXTENSION IDEAS:

Students can continue to find objects at home that come from minerals. They can try to find minerals on hikes, etc., that could be used to produce common objects.

12. SCALABILITY

This exercise can be scaled to any grade level, including college.

13. REFERENCES:

<http://www.rocksandminerals.com/uses.htm>

14. LIST OF EXPERTS AND CONSULTANTS

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15. EVALUATION/REFLECTION BY FELLOWS AND TEACHERS OF HOW IT WENT:

Mineral	Uses	Object Location
aluminum	aluminum foil, cosmetics, beverage cans, deodorant, hand lotion, antacids, cooking pots	
beryllium	fluorescent lamps	
chromium	chrome fixtures (cars, bicycles, lamps, kitchens, etc.), stainless steel	
copper	wires, pipes, cooking pots, old gutters and roofs, brass, pennies	
fluorite (fluoride)	toothpaste, drinking water	
Galena	Main lead ore, car batteries, computers, fuel tanks, TV tubes, leaded glass, x-ray shields, fishing sinkers	
gold	dentistry, jewelry, computers, electronics	
gypsum	wallboard, plaster	
halite (salt)	table salt, food preservatives, de-icers	
Hematite	iron ore, cosmetics, hair dye, steel, wrought iron	
kaolinite	Filler for paper, rubber, medicines, cosmetics, and milkshakes	
Magnetite	Main iron ore, cosmetics, hair dye, steel, wrought iron	
mica	sheetrock, paints, hair dye, cosmetics, soap, electronics	
molybdenum	fertilizer, filament supports in light bulbs, steel	
nickel	nickel coins, stainless steel, alnico magnets, sheetrock	
phosphate	fertilizer, dishwashing detergent, laundry detergent	
potassium	fertilizer, toothpaste	
silica	computer chips, glass, cosmetics, antacids, paint, laundry detergent, drain cleaner, quartz watches	
silver	photography developer, jewelry, electronics, silverware, dentistry	
sulfur	fertilizers, matches, car tires	
talc	baby powder, cosmetics, antacids, sheetrock, primer	
tungsten	filament in light bulbs, drill bits (tool steel)	
zinc	sunblock, fertilizer, cosmetics, dandruff shampoo, pennies, galvanized metal, brass, dry-cell batteries	
zirconium	deodorant, jewelry	