ESS 1: Minerals have specific, quantifiable properties.

☐ 1 I know rocks are composed of one or more minerals.

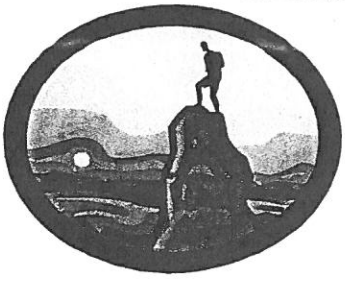
☐ 2 I know that minerals can indicate the type of environment that the mineral formed.

- ☐ Through evaporation such as halite and gypsum
- ☐ Through chemical processes
- ☐ In an igneous (molten rock that cools and hardens) or metamorphic environment (extreme heat and pressure).

☐ 3 I can identify specific properties that can be used to identify the following minerals: Pyrite, Clacite, Fluorite, Magnetite, Hematite, Gypsum, Muscovite, and Galena

- ☐ Luster - either metallic, glassy (vitreous), earthy or chalky, waxy, pearly
- ☐ Hardness - using and understanding the Mohs hardness scale.
- ☐ Cleavage - a break that occurs smoothly along even planes.
- ☐ Streak - using a streak plate to find the color of the mineral in powder form.
- ☐ Magnetism - acts like a magnet or is attracted to a magnet.
- ☐ Fluorescence - glowing under an ultraviolet light.

4 ☐ I can use the Mohs' hardness scale to help identify a mineral's hardness.



Mighty Minerals!!

ESS 2: Igneous, metamorphic and sedimentary rocks have unique characteristics that can be used for identification and/or classification.

1. ☆ I can identify rocks from the three main types (igneous, metamorphic or sedimentary) using the following criteria:
   - ☆ the composition of the rock (what material make up the rock)
   - ☆ the types of minerals present in the rock
   - ☆ the size of the minerals present in the rock
   - ☆ the shape of the minerals in the rock

2. ☆ I can use information gathered about how a rock broke down (weathered) and it's transportation (erosion) to interpret its history of formation and the environment in which it formed.

ESS 3: Igneous, metamorphic and sedimentary rocks form in different ways.

1 ☆ I know that igneous rocks form when magma or lava cools and crystallizes.

2 ☆ I know that metamorphic rocks form when extreme heat and extreme pressure is applied to existing rock.

3 ☆ I know that sedimentary rocks form when existing rock weathers chemically or physically; then the weathetred material is compressed and lithifies (the compaction and cementation of sediments that change it into sedimentary rock).

4 ☆ I can compare and contrast the type of environments that a rock forms using the rock cycle.

5 ☆ I can study the existing bedrock in Ohio to understand Ohio's geological history and past environmental conditoions. Example: formation of sandstone and limestone in Ohio indicates that a shallow sea once covered Ohio.

ESS 4: Soil is unconsolidated material that contains nutrient matter and weathered rock.

1 ☆ I know that soil forms at different rates, depending on the following five factors:

- ☆climate of the area
- ☆slope of the land
- ☆types of vegetation present (trees, plants in the area)
- ☆rate of weathering (amount of time the rock has had to weather)
- ☆type of parent rock it formed from

2 ☆ I know that soil has different properties depending on the five environmental conditions.

3 ☆ I can identify soil type by using the following properties:

- ☆texture (size of mineral pieces)
- ☆color
- ☆composition (minerals that make up the soil)
- ☆permeability (rate in which water is able to move through it)
- ☆porosity (the amount of air and water spaces between the particles that make up the rocks.

4 ☆ I can give a use for a certain soil based on the above properties

- ☆ in agriculture where it provides nutrients for plants.
- ☆ in construction as a foundation for many construction projects or bricks.
- ☆ in filtering and purifying water as rainwater trickles through the horizon layers.
- ☆as a fuel such as coal and peat

5 ☆ I know where the four main soil hroizons are located: O, A, B and C

6 ☆ I can compare and contrast the properties of the soil in the different soil horizons.

7 ☆ I can identify a topographic map.

8 ☆ I can identify a geological map.

ESS 5: Rocks, minerals, and soils have common and practical uses.

1 ☐ I can determine how rocks, minerals, and soil can be used based on their specific physical properties.

- ☐ I know minerals and rocks can be used in construction. Example: gypsum, gravel and sand.
- ☐ I know minerals and rocks can be used to create energy. Example: fossil fuels (coal) and radioactive materials (plutonium and uranium).
- ☐ I know minerals and rocks can be for domestic uses, such as jewelry (gems) and pottery (clay).
- ☐ I know minerals and rocks can be used for technology. Example: lithium for long lasting batteries and silica for computers.
- ☐ I know minerals and rocks can be used for transportation. Example: road salt and asphalt.
- ☐ I know minerals and rocks can be used for agriculture. Example: lime, minerals for fertelizers.

2 ☐ I know that nearly all manufactured material requires some kind of geological resource.

3 ☐ I know that most geologoical resources considered nonrenewable (they will take millions and millions of years to reform if at all).

4 ☐ I can conserve natural resources through the conservation or reducing the use of these resources. Example: alternative energy sources such as solar instead of fossil fuels which are nonrenewable.

5 ☐ I know that extaction methods for getting fossil fuels (strip-mining and open pit mining) can be harmful to the environment.