MEGA MOLECULES

If I am a mineralogist…
I explore minerals.

Experiment 3
Magnifying Minerals

You will need the sandstone rock from the rock collection (A), modeling set for sand (D), magnifying lens (I), sand (O), paper towel, and a phone with a flashlight.

Things To Know:

Rocks are made of minerals. A mineral is a naturally occurring solid crystal with a specific chemical composition. Mineralogists study the crystal structure and the properties of minerals. The most abundant mineral group found in the Earth's crust is the silicate group. One member of the silicate group is silicon dioxide, SiO_2, or quartz. Sand is mostly made up of small pieces of broken quartz. Sand is found on beaches and in deserts. Sandstone is sand cemented together into rock. If you could look inside a grain of sand, you would see atoms of silicon and oxygen in an orderly pattern. Between the atoms are strong chemical attractions called bonds.

Caution!
Do not throw or place the models in your mouth.

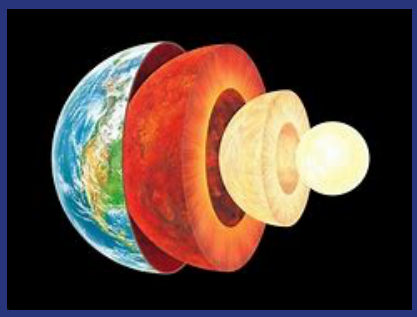
What To Do:

1. Sprinkle a few grains of sand on a paper towel.
2. If you have a phone with a flashlight, shine light on the sand.
3. Use the magnifying lens to examine the sand.

4. On the student sheet, record at least 3 observations and draw a detailed picture of the sand.
5. Use the magnifying lens to examine the sandstone. Compare the grains of sand with the grains in the sandstone.
6. Build a model of sand by connecting 1 silicon atom (purple) to 4 oxygen atoms (red) using the bonds. Each oxygen atom can be connected to two silicon atoms.
7. Look at the sand model and answer the questions about the characteristics and structure of sand on the student sheet.

EARTH'S LAYERS

The interior structure of the Earth has layers of spherical shells.



Crust: The crust is the thin, outermost layer of the Earth. The crust makes up only 1% of the earth's mass. The oceans and continents are located in the crust. The crust is mostly silicon dioxide. Silicon dioxide makes up more than 95 percent of the known rocks.

Mantle: The mantle is the second layer of the earth. It has the biggest volume. Over millions of years, the mantle cooled and is now mostly solid. Most of the rocks that make up Earth's mantle belong to the silicate group. Activity in the mantle drives plate tectonics which causes volcanoes, seafloor spreading, earthquakes, and mountain-building.

Outer Core: This layer is a liquid made up of iron and nickel. The outer core moves around the inner core and creates the Earth's magnetism.

Inner Core: This is the hot center layer of the Earth. The weight and pressure of the outer layers cause the inner core to be a solid.

MEGA MOLECULES

Name _____ Date _____

Experiment 3: Magnifying Minerals

Write 3 observations of sand.

1.

2.

3.

4. Draw the magnified sand.

5. Sand is porous which means that air can pass through it. Based on the model of sand, why do you think this is a characteristic of sand.

6. Sand does not dissolve in water. Based on the model of sand, why do you think this is a characteristic of sand.

7. Sand is very abrasive and is used to make sandpaper. Based on the model of sand, why do you think this is a characteristic of sand.