



LEARNING ACTIVITY:

Rocks Ahoy!

GRADE LEVEL: 2–5

MATERIALS

- Samples of pumice, scoria, and obsidian (Samples can be purchased online through school specialty stores. “Pumice stone” can also be found at bath and body suppliers. Scoria, or “lava rock,” can be purchased at garden supply centers.)
- A large, transparent, plastic tank or bucket half-full of water, with the amount of water significantly more than the size of the largest sample (It is important to use plastic to ensure it won't break during the tests.)
- Towels for spills
- Tongs

Source: Minerals Education Coalition. Adapted with permission.

Pumice, scoria, and obsidian are all igneous rocks. Igneous rocks are rocks that either cooled from hot, liquid magma within the Earth or from volcanic ash or lava on the surface of the Earth. The many types of igneous rocks come from different types of magma that contain different materials and cool at different rates depending on how they are placed.

Pumice forms from magma that contains a large amount of gas bubbles, and when it erupts to the Earth's surface and cools and hardens, these gas bubbles remain in the rock.

Scoria is another volcanic rock with holes in it, though the amount of volcanic material between the holes is usually thicker, or more compacted, in scoria than in pumice. It is often dark red.

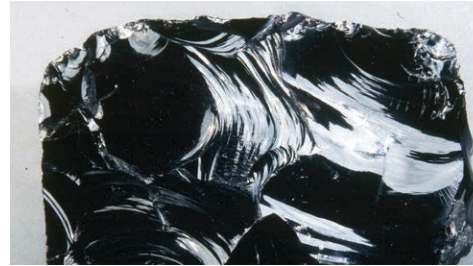
Obsidian is a shiny, dark, dense volcanic glass. It was formed from lava that cooled very quickly. It normally contains very few gas bubbles, if any.

PROCEDURE

- 1 Compare the samples by simply holding them and seeing which you find heavier and which feels lighter. Do you think these samples are heavier or lighter than water? Density describes the relationship between the amount of material (mass) contained in the sample and the amount



Pumice
Credit: deltalimatrieste/
Wikimedia



Obsidian
Credit: ©Dr. Richard Busch, from the ESW Image Bank



Scoria material on flank of Teide on Tenerife, Canary Islands, Spain

Credit: Chmee2/Wikimedia CC BY-SA 3.0

of space taken up by the sample (its volume). A sample that feels heavier than another sample of about the same size has more material within the sample, which is to say the heavier sample is more dense than the other. A sample that sinks is denser than water.

- 2 Now test each sample by placing it into the tank to see what happens. Note: Some specimens may become water-logged if they sit in the water too long, so try to test dry specimens.
- 3 Discuss the results. How do you think commercial use of these items would vary based on the differences of these samples?

FURTHER DISCUSSION

- Why would pumice be used to make lightweight construction materials such as concrete block and concrete?

- Why do you think pumice is mined for use in abrasives (for personal care, industrial cleaners, rubber erasers, stonewash jeans, etc.) and in absorbents (potting soil, pet litter, etc.)?
- Why do you think scoria is used in landscaping instead of obsidian?
- Why has obsidian been used throughout history to make sharp tools for cutting?
- What other materials are mined due to their useful characteristics?

NGSS CONNECTIONS

- Science and Engineering Practices — Analyzing and Interpreting Data
- Disciplinary Core Ideas — Earth and Human Activity
- Crosscutting Concepts — Cause and Effect

(For more standards correlations go to www.MineralsEducationCoalition.org/standards.)

This activity is based on the “Sink & Float Rocks” activity on the MEC website. Learn more about rocks and the rock cycle at www.MineralsEducationCoalition.org.