15. Granite

Granite is an igneous rock that consists primarily of quartz, potassium feldspar, and muscovite mica in varying percentages. Small amounts of dark-colored silicate minerals can be mixed in. Quartz has a hardness of 7 and feldspar has a hardness of 6 on the Mohs hardness scale, which makes granite a hard rock, ideal for high-use and weather-exposed surfaces. The Mount Rushmore National Memorial is carved in a granite mountain. Igneous rocks form from magma (molten rock) cooling and hardening beneath the surface of the Earth. They can be exposed later as a result of tectonic activity, such as mountain building and continental drift. Where accessible deposits of granite are found in sufficient quantity and quality, it are quarried as dimension stone, which is rock cut and finished to specific size and shape for many uses: monuments for cemeteries and public places, building facing (including the Texas Capitol building), and, most recently, countertops and tabletops in homes, restaurants, and other buildings. Rough blocks of granite are used as riprap to protect coastlines by preventing erosion, such as forming the jetties at Galveston Island of the Texas coast. Crushed granite gravel is often used on trails, such as in the Houston area.

Activities:

K-3: The Texas State Capitol building is constructed with Texas pink granite that is mined in central Texas. The pink or red color comes from the large amounts of potassium feldspar among the other minerals in the granite. Draw a picture of pink granite by drawing nine rectangles at different angles and different sizes. Each rectangle should touch edges of the other rectangles around it. Color two-thirds (2 of every 3) of the rectangles in a pinkish tan color, and color the remaining 1/3 of them in a light gray color. Then, take a black crayon or marker and put a bunch of black dots mixed in with the other two colors. You have drawn a Texas pink granite! The pinkish tan is the feldspar, gray is quartz, and black dots are biotite and other mafic minerals, which are rich in magnesium and iron.

4-5: Two common building stones are granite and limestone. Granite is a mixture of minerals. The two most common are feldspar and quartz. Quartz is the most common mineral on the surface of the earth and is harder than steel with a rating of 7 on the Mohs hardness scale of 1–10, with 1 being talc and diamond being 10. Limestone (calcite) has a hardness of 3 on the hardness scale. Could calcite scratch quartz? Yes No. Could quartz scratch calcite? Yes No.

15. Granite continued

6+: Although granite is a hard rock, over many thousands of years, granite exposed at or near to the Earth's surface can decompose due to a process called weathering. Feldspar alters into tiny pieces of clay and quartz decomposes into pieces of quartz that are much larger than the clay, eventually reducing to the size of beach sand.

Fill a glass jar about ¾ full, add some sand and some muddy or clayey dirt. Shake it up and watch as the particles settle to the bottom of the jar. Which settles faster in water: the sand or the fine pieces of clay in the mud? _____

(In answering the following questions related to the jar experiment, you can conduct research online.)

If a river carrying clay and sand empties into the ocean, which settles faster next to the beach?

_____

How does the energy introduced by wave action on the beach influence settling:

_____

_____

_____.

Is the sand or clay carried farther out into the ocean before it settles? _____.