



How Does Pressure Change Minerals?

The difference between quartz monzonite and gneiss is a lot of pressure. In this experiment we'll learn how pressure can make the minerals in a rock line up in the same direction and form bands and foliation, or thin leaf-like layers.

Problem:

What is foliation? What causes it?

Materials:

Lump of clay

Handful of long-grain or wild rice

Rolling pin

Rolling surface

Sample of quartz monzonite*

Sample of gneiss**

Procedure:

1. Flatten the lump of clay and then pinch it into a bowl shape.
2. Fill the "bowl" with the grains of rice and pinch the bowl shut so the rice is inside a ball.
3. Knead and squish the clay-and-rice until the rice grains are pretty much evenly distributed.
4. Compare it to the quartz monzonite sample. Like the quartz monzonite, the clay ball has been formed without too much pressure, so the grains go in every direction.
5. Now put the ball of clay on the rolling surface and roll it out flat.
6. Fold it over and roll it in the same direction. Keep folding it and rolling it flat again and again, in the same direction each time. After several minutes you should start to notice the rice grains are mostly pointing in the same direction, and may be forming bands and layers.
7. Compare the folded-and-flattened clay to the sample of gneiss. Like the clay, the gneiss has been compressed until the minerals in it tend to line up in the same direction and form layers.

*Monzonite is an igneous intrusive rock. It is composed of approximately equal amounts of plagioclase and alkali feldspar, with less than 5% quartz by weight. It may contain minor amounts of hornblende, biotite and other minerals.

**Gneiss is a common distributed type of rock formed by high-grade regional metamorphic processes from pre-existing formations that were originally either igneous or sedimentary rocks. It is often foliated.

MINERAL NAME SCRAMBLE

Here is a list of mineral names. The problem is, the letters are all mixed up.
Can you unscramble the mineral names? Be prepared: there are some tough ones here!

yttmaehs _____

bsoseats _____

eratbi _____

iilvoen _____

tpyire _____

yubr _____

fuuslr _____

ztpoa _____

zciorn _____

tnwueilfe _____

sttbinei _____

nratge _____

upsygu _____

ghpartei _____

letoufri _____

tatipae _____

rdalfeps _____



Source: <http://www.kidsloverocks.com/pdf/Activity08.pdf>

Answers: 1st column - amethyst, asbestos, barite, olivine, pyrite, ruby, sulfur, topaz, zircon, wulfenite, stibnite, garnet
2nd column - <error> Should have been "gypsum", graphite, fluorite, apatite, feldspar