

Batholiths The largest intrusive igneous rock bodies are **batholiths**. They can be many hundreds of kilometers in width and length and several kilometers thick. Batholiths form when magma bodies that are being forced upward from inside Earth cool slowly and solidify before reaching the surface. However, not all of them remain hidden inside Earth. Some batholiths have been exposed at Earth's surface by many years of erosion. The granite domes of Yosemite National Park are the remains of a huge batholith that stretches across much of the length of California.

Math Skills Activity

Classifying Igneous Rocks

Igneous rocks are classified into three types depending on the amount of silica they contain. Basaltic rocks contain approximately 45 percent to 52 percent silica. Andesitic, or intermediate, rocks contain about 52 percent to 66 percent silica, and granitic rocks have more than 66 percent silica. The lighter the color is, the higher the silica content is.



Example Problem

A 900-kg block of igneous rock contains 630 kg of silica. Calculate the percent of silica in the rock to classify it.

Solution

1 This is what you know:

$$\begin{aligned} \text{rock} &= 900 \text{ kg} \\ \text{silica} &= 630 \text{ kg} \end{aligned}$$

2 This is what you need to find:

The percentage of silica: x

3 This is the equation you need to use:

$$\text{Mass of silica} / \text{mass of rock} = x / 100$$

4 Solve the equation for x :

$$x = (630 \text{ kg} / 900 \text{ kg}) \times 100$$

$$x = 70 \text{ percent, therefore, the rock is granitic.}$$

Check your answer by dividing it by 100, then multiplying by 900. Did you get the given amount of silica?

Practice Problems

1. A 250-kg boulder of basalt contains 125 kg of silica. Use the classification system to determine whether basalt is light or dark.
2. Andesite is an intermediate, medium-colored rock with a silica content ranging from 52 percent to 66 percent. About how many kilograms of silica would you predict to be in a 68-kg boulder of andesite?

For help with solving equations, refer to the **Math Skill Handbook**.