

Physical Science Laboratory: Identification of Rocks

Objective: After successfully completing this laboratory you will be able to identify several rocks according to their properties and sort them into the classifications: igneous, metamorphic and sedimentary.

Materials: 16 piece rock set, triple beam balance, overflow apparatus, graduated cylinder (25mL).

Instructions: Obtain a box of rocks from the instructor and spread the samples out in order on your desk. Divide the rocks into igneous (numbers 1 to 7); sedimentary (numbers 8 to 11) and metamorphic (numbers 12 to 16). (16 points)

Igneous Rocks:

The seven igneous rocks in your kit are basalt, diorite, felsite porphyry, gabbro, granite, obsidian and pumice. Follow the instructions to match the numbers to the names. There are two extrusive rocks that are the result of lava cooling rapidly. One has a glassy texture and one has a frothy texture. Determine which two rocks have these characteristics and note "glassy" and "frothy" in the texture column of the data table. The remaining two rocks exhibit two textures: extrusive (fine-grained) and intrusive (coarse-grained). Mark "extrusive" or "intrusive" in the texture column.

Next determine the color of each rock. Use words like dark, light, light with dark specks, etc. to describe the color. Dark rocks are mafic or ultramafic and light rocks are sialic or intermediate. Now using the information you have collected in your chart and information in your textbook and lecture notes, assign a name to each numbered rock in this group.

Number	Texture	Color	Name
1			
2			
3			
4			
5			
6			
7			

Sedimentary Rocks:

Next examine the four sedimentary rocks (8 to 11). Your set contains conglomerate, limestone, sandstone and shale. One of the rocks is a chemical sedimentary rock rather than a detrital sedimentary rock. The three detrital sedimentary rocks are distinguished according to the size of their particles. Consult your textbook and your lecture notes and assign the name of the sedimentary rock to its number.

Number	Particle Size	Name
8		
9		
10		
11		

Metamorphic Rocks:

The set of metamorphic rocks contains **gneiss, marble, quartzite, schist** and **slate**. Metamorphic rocks are best identified by looking at pictures and by comparing them to the igneous rocks and sedimentary rocks they were originally. Your set has metamorphic equivalents of sandstone, shale, limestone and granite. Look at these igneous and sedimentary rocks for comparison. Consult your notes and textbook and identify these metamorphic rocks.

Number	Rock Type Before Metamorphosis	Name
12		
13		
14		
15		
16		

Density: (7 points)

Next the density of two rocks will be compared. Select rock number six and rock number one. Determine the mass of each rock using a triple beam balance. Submerge the rock in an overflow container filled to the rim with water. Catch the water that overflows in a graduated cylinder and record its volume. Repeat this procedure two additional times so that you collect three sets of data. Fill out the data table below.

Rock Number	Mass (grams)	Volume (mL)	Density (g/mL)
1-trial one			
1-trial two			
1-trial three			
1-average			
6-trial one			
6-trial two			
6-trial three			
6-average			

Questions:

1. Which of the two rocks has the greater density? Does this result seem reasonable? Why?

Classifying the Shelf Rocks: Determine the identity of each rock



It is possible for there to be two samples of the same rock type. Not all rock types are here. (17 points)

#	Name of Rock Type	Evidence for your choice
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		