

**Interpreting Changes in Rocks****Problem/Question**

How do the characteristics of sedimentary and metamorphic rocks compare?

**Background:**

As the rock cycle continues, and rocks change from one type to another, more changes occur than meet the eye. Color, grain size, texture and mineral composition are easily observed and described visually. Yet, with mineral changes come changes in crystal structure and density. How can these be accounted for and described? Studying pairs of sedimentary and metamorphic rocks can show you how.

**Objectives**

*In this GeoLab, you will:*

- Describe the characteristics of sedimentary and metamorphic rocks.
- Determine the density of different rock types.
- Infer how metamorphism changes the structure of rocks.

**Materials**

- samples of sedimentary rocks and their metamorphic equivalents
- magnifying glass or hand lens
- paper
- pencil
- beam balance
- 100-mL graduated cylinder or beaker large enough to hold the rock samples
- water

**Procedure**

1. Observe each rock sample. Record any specific characteristics in the data table.
2. Measure the mass of each sample using the triple beam balance. Record the mass in the data table.
3. Measure the volume of a rock sample using a displacement of water and a graduated cylinder and beaker. Record the volume in the data table below.
4. Recall that density = mass/volume. Using the mass and volume measurements determine the density of each rock sample and record this information in the data table.

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### DATA TABLE

Sample Number	Rock Type	Specific Characteristics	Mass	Volume	Density

### Analysis/Conclusions

*Directions:* Answer each of the following on a **separate sheet of paper**.

1. Compare and contrast sandstone and quartzite.
2. How does the grain size of a sandstone change during metamorphism?
3. What textural differences do you observe between shale and slate?
4. Compare the densities you calculated with other students. Does everybody have the same answer? What are some of the reasons that answers may vary?
5. Why might the color of a sedimentary rock change during metamorphism?
6. Compare the density of sandstone and a quartzite. Which rock has a greater density? Explain.
7. Compare the densities of shale and slate, and limestone and marble. Does density always change in the same way? Explain the results that you observed.