

## Metamorphic Rock Lab

Earth Science

Mr. Traeger

Name: \_\_\_\_\_ Period: \_\_\_\_\_ Date: \_\_\_\_\_

### Introduction/Purpose

This lab is intended to familiarize the student with various samples of metamorphic rock. This lab will also give the student practice in distinguishing differences between a parent rock and its resulting metamorphic counterpart.

### Materials

- metamorphic rock samples
- parent sedimentary rock samples
- metric ruler
- triple-beam balance
- *Earth Science* textbook
- parent igneous rock samples
- hand lens
- graduated cylinders/beakers
- water

### Procedure

1. Working with a partner, your task is to make an attempt to identify at least metamorphic rock samples at the front of the room. If you have more time, you may do more for extra credit.
2. Go through the accompanying chart and go through the steps to identify the rocks. Use your textbook, pages 141 to 144 and page 874 in the back.
3. Compare each metamorphic rock to its igneous or sedimentary parent rock. Determine the density of each rock. Measure the mass of the rock in grams on a triple-beam balance. Determine the volume of the rock in milliliters by noting what volume of water is displaced when the rock is placed into a beaker or graduated cylinder. Divide the mass of the rock by the volume of the rock to find the density in units of grams/milliliter.
4. Answer the questions and write a conclusion.
5. When you are done, staple the Igneous, Sedimentary, and Metamorphic rock labs together and place them in the appropriate inbox.

### Data Collection/Analysis

See identification chart.

### Questions

1. What is the difference between foliated and nonfoliated textures?

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2. Is it possible for the mineral composition to change when a rock undergoes metamorphism? Explain.
  
  
  
  
  
  
  
  
  
  
3. Did any of your samples have parent rocks that looked completely different from their metamorphic counterparts?
  
  
  
  
  
  
  
  
  
  
4. What determines the degree to which a rock undergoes metamorphism? In other words, what causes some rocks to be more deformed than others?
  
  
  
  
  
  
  
  
  
  
5. Which rocks were generally more dense, the parent rock or the metamorphic rock? Why?
  
  
  
  
  
  
  
  
  
  
6. Look on pages 141-144 in your book to answer these questions. Describe regional metamorphism. Also describe the two types of local metamorphism called contact and deformational metamorphism. Do this in the chart below.

| Regional Metamorphism | Local Metamorphism |               |
|-----------------------|--------------------|---------------|
|                       | Contact            | Deformational |
|                       |                    |               |

**Conclusion:** What did you learn from this lab?

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| rock # and sketch | color(s)? mineral composition? | grain/crystal size (mm) | foliated or nonfoliated texture? | degree of metamorphism (low, medium, or high)? | metamorphic rock: possible ID? | parent rock name and type             | density of metamorphic rock (higher or lower) | density of parent rock (higher or lower) |
|-------------------|--------------------------------|-------------------------|----------------------------------|--|--------------------------------|---------------------------------------|---|--|
| <u>1</u>          |                                |                         |                                  |  |                                | Igneous granite or sedimentary schist |   |  |
| <u>2</u>          |                                |                         |                                  |  |                                | Sedimentary sandstone                 |   |  |
| 3                 |                                |                         |                                  |  |                                | Sedimentary shale                     |   |  |
| <u>4</u>          |                                |                         |                                  |  |                                | Metamorphic phyllite                  |   |  |
| 5                 |                                |                         |                                  |  |                                | Igneous granite                       |   |  |
| <u>6</u>          |                                |                         |                                  |  |                                | Sedimentary conglomerate              |   |  |
| 7                 |                                |                         |                                  |  |                                | Sedimentary limestone                 |   |  |

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|-------------------|--------------------------------|-------------------------|----------------------------------|--|--------------------------------|--------------------------------|---|--|
| <u>8</u>          |                                |                         |                                  |  |                                | Sedimentary shale              |   |  |
| <u>9</u>          |                                |                         |                                  |  |                                | Metamorphic slate              |   |  |
| <u>10</u>         |                                |                         |                                  |  |                                | Sedimentary limestone          |   |  |
| <u>11</u>         |                                |                         |                                  |  |                                | Sedimentary bituminous coal    |   |  |
| <u>12</u>         |                                |                         |                                  |  |                                | Metamorphic schist or phyllite |   |  |
| 13                |                                |                         |                                  |  |                                | Sedimentary sandstone          |   |  |
| <u>14</u>         |                                |                         |                                  |  | Official CA State Rock!        | Igneous peridotite             |   |  |