

**Name:** \_\_\_\_\_

# Rocks & Minerals Labs

The purpose of this laboratory experiment is to have students interact in multiple ways with rocks and minerals. They are asked to conduct observations and make inferences about the rocks they are using. At the conclusion of this lab, the students will be able to identify by name minerals on page 16 of the Earth Science Reference Tables, and be able to identify using clear characteristics the three types of rocks.

This lab counts as 240 minutes (6 lab periods) toward the State requirement of 1200 minutes.

# Hardness Lab

**Objective:** You will determine the relative hardness of common objects relative to the known hardness of index minerals.

**Materials:** Penny, glass plate, and steel nail.

**Directions:** In the data table below, if you can scratch the object with the index mineral, then record a (+) in the table. If you can **not** scratch the object with the mineral, then record a (-) in the table.

<u>Index Mineral</u>	<u>Fingernail</u>	<u>Penny</u>	<u>Glass</u>	<u>Steel</u>
<u>1</u>				
<u>2</u>				
<u>3</u>				
<u>4</u>				
<u>5</u>				
<u>6</u>				
<u>7</u>				
<u>8</u>				
<u>9</u>				

## Hardness Lab Questions:

1. Based on the data table, state the relative hardness of each of the objects:

**Fingernail:** \_\_\_\_\_  
**Glass Plate:** \_\_\_\_\_

**Penny:** \_\_\_\_\_  
**Steel Nail:** \_\_\_\_\_

2. Using the Earth Science Reference Tables,

a. name two minerals that have a hardness greater than glass

- (1) \_\_\_\_\_  
(2) \_\_\_\_\_

b. name two minerals which would scratch a penny, but not the glass

- (1) \_\_\_\_\_  
(2) \_\_\_\_\_

c. name two minerals which you could scratch with your fingernail

- (1) \_\_\_\_\_  
(2) \_\_\_\_\_

3. Name a mineral, besides diamond, which could be used to cut glass. \_\_\_\_\_

4. How would knowing the relative hardness of a mineral be useful to a mineralogist?

# Mineral Identification Lab

**Objective:** You will determine the name of unknown minerals based on their physical characteristics using the Earth Science Reference Tables.

**Materials:** **Unknown mineral samples**  
**Earth Science Reference Tables**  
**Porcelain Streak plate**  
**Glass plate**

**Directions:** For each unknown mineral, identify the key physical characteristics. Using your Earth Science Reference Tables, determine the name of the mineral based on the observed characteristics.

Mineral	Luster	Hardness	Cleavage/Fracture	Streak Color	Mineral Name
Sample A	<input type="checkbox"/> Metallic <input type="checkbox"/> Non-Metallic		<input type="checkbox"/> Cleavage <input type="checkbox"/> Fracture		

Mineral	Luster	Hardness	Cleavage/Fracture	Streak Color	Mineral Name
Sample B	<input type="checkbox"/> Metallic <input type="checkbox"/> Non-Metallic		<input type="checkbox"/> Cleavage <input type="checkbox"/> Fracture		

Mineral	Luster	Hardness	Cleavage/Fracture	Streak Color	Mineral Name
Sample C	<input type="checkbox"/> Metallic <input type="checkbox"/> Non-Metallic		<input type="checkbox"/> Cleavage <input type="checkbox"/> Fracture		

Mineral	Luster	Hardness	Cleavage/Fracture	Streak Color	Mineral Name
Sample D	<input type="checkbox"/> Metallic <input type="checkbox"/> Non-Metallic		<input type="checkbox"/> Cleavage <input type="checkbox"/> Fracture		

Mineral	Luster	Hardness	Cleavage/Fracture	Streak Color	Mineral Name
Sample E	<input type="checkbox"/> Metallic <input type="checkbox"/> Non-Metallic		<input type="checkbox"/> Cleavage <input type="checkbox"/> Fracture		

Mineral	Luster	Hardness	Cleavage/Fracture	Streak Color	Mineral Name
Sample F	<input type="checkbox"/> Metallic <input type="checkbox"/> Non-Metallic		<input type="checkbox"/> Cleavage <input type="checkbox"/> Fracture		

# Mineral Identification Evaluation

Using your Earth Science Reference Tables and your knowledge of how to identify minerals based on their physical characteristics, determine the name of each mineral.

**You will have 3 minutes to identify each mineral.**

**Materials:**            **Six unknown minerals.**  
                              **Streak plate**  
                              **Glass plate.**

Mineral	Luster	Hardness	Cleavage/Fracture	Streak Color	Mineral Name
Sample A	<input type="checkbox"/> Metallic <input type="checkbox"/> Non-Metallic		<input type="checkbox"/> Cleavage <input type="checkbox"/> Fracture		

Mineral	Luster	Hardness	Cleavage/Fracture	Streak Color	Mineral Name
Sample B	<input type="checkbox"/> Metallic <input type="checkbox"/> Non-Metallic		<input type="checkbox"/> Cleavage <input type="checkbox"/> Fracture		

Mineral	Luster	Hardness	Cleavage/Fracture	Streak Color	Mineral Name
Sample C	<input type="checkbox"/> Metallic <input type="checkbox"/> Non-Metallic		<input type="checkbox"/> Cleavage <input type="checkbox"/> Fracture		

Mineral	Luster	Hardness	Cleavage/Fracture	Streak Color	Mineral Name
Sample D	<input type="checkbox"/> Metallic <input type="checkbox"/> Non-Metallic		<input type="checkbox"/> Cleavage <input type="checkbox"/> Fracture		

Mineral	Luster	Hardness	Cleavage/Fracture	Streak Color	Mineral Name
Sample E	<input type="checkbox"/> Metallic <input type="checkbox"/> Non-Metallic		<input type="checkbox"/> Cleavage <input type="checkbox"/> Fracture		

Mineral	Luster	Hardness	Cleavage/Fracture	Streak Color	Mineral Name
Sample F	<input type="checkbox"/> Metallic <input type="checkbox"/> Non-Metallic		<input type="checkbox"/> Cleavage <input type="checkbox"/> Fracture		

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# Sedimentary Rock Lab

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**Objective:** You will determine the name of unknown sedimentary rocks based on their physical characteristics using the Earth Science Reference Tables.

**Materials:** Unknown sedimentary rock samples  
Earth Science Reference Tables

**Directions:** For each unknown sedimentary rock, identify the key physical characteristics. Using your Earth Science Reference Tables, determine the name of the sedimentary rock based on the observed characteristics.

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**Sample A:**

Yes	No	Key Identifying Feature	Question
<input type="checkbox"/>	<input type="checkbox"/>	Clasts	Can you see clasts in this sample?  If yes, are the clasts all the same size? <input type="checkbox"/> Yes <input type="checkbox"/> No  If yes, are the clasts angular or rounded? <input type="checkbox"/> Angular <input type="checkbox"/> Rounded
<input type="checkbox"/>	<input type="checkbox"/>	Strata	Can you see clearly defined layers in this sample?
<input type="checkbox"/>	<input type="checkbox"/>	Fossils	Can you see fossils in this sample?

In a **COMPLETE SENTENCE** state why this rock would be classified as a sedimentary rock.

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**Based on your observations, what would the name of this sedimentary rock be:**

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**Sample B:**

Yes	No	Key Identifying Feature	Question
<input type="checkbox"/>	<input type="checkbox"/>	<b>Clasts</b>	<b>Can you see clasts in this sample?</b> <b>If yes, are the clasts all the same size?</b> <input type="checkbox"/> <b>Yes</b> <input type="checkbox"/> <b>No</b> <b>If yes, are the clasts angular or rounded?</b> <input type="checkbox"/> <b>Angular</b> <input type="checkbox"/> <b>Rounded</b>
<input type="checkbox"/>	<input type="checkbox"/>	<b>Strata</b>	<b>Can you see clearly defined layers in this sample?</b>
<input type="checkbox"/>	<input type="checkbox"/>	<b>Fossils</b>	<b>Can you see fossils in this sample?</b>

In a **COMPLETE SENTENCE** state why this rock would be classified as a sedimentary rock.

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**Based on your observations, what would the name of this sedimentary rock be:**

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**Sample C:**

Yes	No	Key Identifying Feature	Question
<input type="checkbox"/>	<input type="checkbox"/>	<b>Clasts</b>	<b>Can you see clasts in this sample?</b> <b>If yes, are the clasts all the same size?</b> <input type="checkbox"/> <b>Yes</b> <input type="checkbox"/> <b>No</b> <b>If yes, are the clasts angular or rounded?</b> <input type="checkbox"/> <b>Angular</b> <input type="checkbox"/> <b>Rounded</b>
<input type="checkbox"/>	<input type="checkbox"/>	<b>Strata</b>	<b>Can you see clearly defined layers in this sample?</b>
<input type="checkbox"/>	<input type="checkbox"/>	<b>Fossils</b>	<b>Can you see fossils in this sample?</b>

In a **COMPLETE SENTENCE** state why this rock would be classified as a sedimentary rock.

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**Based on your observations, what would the name of this sedimentary rock be:**

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# Igneous Rock Lab

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**Objective:** You will determine the name of unknown igneous rocks based on their physical characteristics using the Earth Science Reference Tables.

**Materials:** **Unknown igneous rock samples**  
**Earth Science Reference Tables**

**Directions:** For each unknown igneous rock, identify the key physical characteristics. Using your Earth Science Reference Tables, determine the name of the igneous rock based on the observed characteristics.

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**Sample A:**

<b>Characteristic</b>			
<b>Color</b>	<input type="checkbox"/> <b>Light Colored</b>	<input type="checkbox"/> <b>Dark Colored</b>	
<b>Density</b>	<input type="checkbox"/> <b>Low Density</b>	<input type="checkbox"/> <b>High Density</b>	
<b>Texture</b>	<input type="checkbox"/> <b>Coarse Grained</b>	<input type="checkbox"/> <b>Fine Grained</b>	<input type="checkbox"/> <b>Glassy Texture</b>

<b>Yes</b>	<b>No</b>	<b>Key Identifying Feature</b>
<input type="checkbox"/>	<input type="checkbox"/>	Does this igneous rock have a glassy texture?
<input type="checkbox"/>	<input type="checkbox"/>	Are the grains interlocked?

In a **COMPLETE SENTENCE** state why this rock would be classified as an igneous rock.

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**Based on your observations, what would the name of this igneous rock be:**

**Sample B:**

<b>Characteristic</b>			
<b>Color</b>	<input type="checkbox"/> <b>Light Colored</b>	<input type="checkbox"/> <b>Dark Colored</b>	
<b>Density</b>	<input type="checkbox"/> <b>Low Density</b>	<input type="checkbox"/> <b>High Density</b>	
<b>Texture</b>	<input type="checkbox"/> <b>Coarse Grained</b>	<input type="checkbox"/> <b>Fine Grained</b>	<input type="checkbox"/> <b>Glassy Texture</b>

<b>Yes</b>	<b>No</b>	<b>Key Identifying Feature</b>
<input type="checkbox"/>	<input type="checkbox"/>	Does this igneous rock have a glassy texture?
<input type="checkbox"/>	<input type="checkbox"/>	Are the grains interlocked?

In a **COMPLETE SENTENCE** state why this rock would be classified as an igneous rock.

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**Based on your observations, what would the name of this igneous rock be:**

**Sample C:**

<b>Characteristic</b>			
<b>Color</b>	<input type="checkbox"/> <b>Light Colored</b>	<input type="checkbox"/> <b>Dark Colored</b>	
<b>Density</b>	<input type="checkbox"/> <b>Low Density</b>	<input type="checkbox"/> <b>High Density</b>	
<b>Texture</b>	<input type="checkbox"/> <b>Coarse Grained</b>	<input type="checkbox"/> <b>Fine Grained</b>	<input type="checkbox"/> <b>Glassy Texture</b>

<b>Yes</b>	<b>No</b>	<b>Key Identifying Feature</b>
<input type="checkbox"/>	<input type="checkbox"/>	Does this igneous rock have a glassy texture?
<input type="checkbox"/>	<input type="checkbox"/>	Are the grains interlocked?

In a **COMPLETE SENTENCE** state why this rock would be classified as an igneous rock.

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**Based on your observations, what would the name of this igneous rock be:**

# Metamorphic Rock Lab

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**Objective:** You will determine the name of unknown metamorphic rocks based on their physical characteristics using the Earth Science Reference Tables.

**Materials:** Unknown metamorphic rock samples  
Earth Science Reference Tables

**Directions:** For each unknown metamorphic rock, identify the key physical characteristics. Using your Earth Science Reference Tables, determine the name of the metamorphic rock based on the observed characteristics.

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## Sample A:

Yes	No	Key Identifying Feature
<input type="checkbox"/>	<input type="checkbox"/>	Is this metamorphic rock foliated?
<input type="checkbox"/>	<input type="checkbox"/>	Does this metamorphic rock have a distorted structure?
<input type="checkbox"/>	<input type="checkbox"/>	Are there any key metamorphic identifier minerals? <input type="checkbox"/> Garnet <input type="checkbox"/> Mica

In a **COMPLETE SENTENCE** state why this rock would be classified as a metamorphic rock.

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**Based on your observations, what would the name of this metamorphic rock be:**

**Sample B:**

Yes	No	Key Identifying Feature
<input type="checkbox"/>	<input type="checkbox"/>	Is this metamorphic rock foliated?
<input type="checkbox"/>	<input type="checkbox"/>	Does this metamorphic rock have a distorted structure?
<input type="checkbox"/>	<input type="checkbox"/>	Are there any key metamorphic identifier minerals? <input type="checkbox"/> Garnet <input type="checkbox"/> Mica

In a **COMPLETE SENTENCE** state why this rock would be classified as a metamorphic rock.

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**Based on your observations, what would the name of this metamorphic rock be:**

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**Sample C:**

Yes	No	Key Identifying Feature
<input type="checkbox"/>	<input type="checkbox"/>	Is this metamorphic rock foliated?
<input type="checkbox"/>	<input type="checkbox"/>	Does this metamorphic rock have a distorted structure?
<input type="checkbox"/>	<input type="checkbox"/>	Are there any key metamorphic identifier minerals? <input type="checkbox"/> Garnet <input type="checkbox"/> Mica

In a **COMPLETE SENTENCE** state why this rock would be classified as a metamorphic rock.

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**Based on your observations, what would the name of this metamorphic rock be:**

# Rock Identification Evaluation

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Using what you have learned in the previous labs and your Earth Science Reference Tables, please place a check mark in the appropriate box to indicate whether the sample is classified as an igneous rock, a sedimentary rock, or a metamorphic rock. Then explain why you classified the sample as you have ***in a complete sentence.*** You will have **3 minutes to evaluate each sample.**

**ROCK SAMPLE #1:**

SEDIMENTARY

IGNEOUS

METAMORPHIC

In a complete sentence, explain your reason for this classification. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**ROCK SAMPLE #2:**

SEDIMENTARY

IGNEOUS

METAMORPHIC

In a complete sentence, explain your reason for this classification. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**ROCK SAMPLE #3:**

SEDIMENTARY

IGNEOUS

METAMORPHIC

In a complete sentence, explain your reason for this classification. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**ROCK SAMPLE #4:**

**SEDIMENTARY**

**IGNEOUS**

**METAMORPHIC**

In a complete sentence, explain your reason for this classification. \_\_\_\_\_

**ROCK SAMPLE #5:**

**SEDIMENTARY**

**IGNEOUS**

**METAMORPHIC**

In a complete sentence, explain your reason for this classification. \_\_\_\_\_

# Lab Evaluation for Unit

**MINERALS:**

Hardness of Minerals Lab: \_\_\_\_\_ minutes (out of 40)

Mineral Identification Lab: \_\_\_\_\_ minutes (out of 40)

**SEDIMENTARY ROCKS:**

Sedimentary Rock Lab: \_\_\_\_\_ minutes (out of 40)

**IGNEOUS ROCKS:**

Igneous Rock Lab: \_\_\_\_\_ minutes (out of 40)

**METAMORPHIC ROCKS:**

Metamorphic Rock Lab: \_\_\_\_\_ minutes (out of 40)

**EVALUATIONS:**

Minerals/Rocks: \_\_\_\_\_ minutes (out of 40)

**TOTAL MINUTES EARNED:** \_\_\_\_\_