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.

Index Mineral	Fingernail	Penny	Glass	Steel
1				
2				
3				
4				
5				
6				
7				
8				
9				

Hardness Lab Questions:

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

Fingernail: _____ **Penny:** _____
Glass Plate: _____ **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	☐ Metallic ☐ Non-Metallic		☐ Cleavage ☐ Fracture		

Mineral	Luster	Hardness	Cleavage/Fracture	Streak Color	Mineral Name
Sample B	☐ Metallic ☐ Non-Metallic		☐ Cleavage ☐ Fracture		

Mineral	Luster	Hardness	Cleavage/Fracture	Streak Color	Mineral Name
Sample C	☐ Metallic ☐ Non-Metallic		☐ Cleavage ☐ Fracture		

Mineral	Luster	Hardness	Cleavage/Fracture	Streak Color	Mineral Name
Sample D	☐ Metallic ☐ Non-Metallic		☐ Cleavage ☐ Fracture		

Mineral	Luster	Hardness	Cleavage/Fracture	Streak Color	Mineral Name
Sample E	☐ Metallic ☐ Non-Metallic		☐ Cleavage ☐ Fracture		

Mineral	Luster	Hardness	Cleavage/Fracture	Streak Color	Mineral Name
Sample F	☐ Metallic ☐ Non-Metallic		☐ Cleavage ☐ 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	☐ Metallic ☐ Non-Metallic		☐ Cleavage ☐ Fracture		

Mineral	Luster	Hardness	Cleavage/Fracture	Streak Color	Mineral Name
Sample B	☐ Metallic ☐ Non-Metallic		☐ Cleavage ☐ Fracture		

Mineral	Luster	Hardness	Cleavage/Fracture	Streak Color	Mineral Name
Sample C	☐ Metallic ☐ Non-Metallic		☐ Cleavage ☐ Fracture		

Mineral	Luster	Hardness	Cleavage/Fracture	Streak Color	Mineral Name
Sample D	☐ Metallic ☐ Non-Metallic		☐ Cleavage ☐ Fracture		

Mineral	Luster	Hardness	Cleavage/Fracture	Streak Color	Mineral Name
Sample E	☐ Metallic ☐ Non-Metallic		☐ Cleavage ☐ Fracture		

Mineral	Luster	Hardness	Cleavage/Fracture	Streak Color	Mineral Name
Sample F	☐ Metallic ☐ Non-Metallic		☐ Cleavage ☐ Fracture		

Sedimentary Rock Lab

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.

Sample A:

Yes	No	Key Identifying Feature	Question
☐	☐	**Clasts**	**Can you see clasts in this sample?** **If yes, are the clasts all the same size?** ☐ **Yes** ☐ **No** **If yes, are the clasts angular or rounded?** ☐ **Angular** ☐ **Rounded**
☐	☐	**Strata**	**Can you see clearly defined layers in this sample?**
☐	☐	**Fossils**	**Can you see fossils in this sample?**

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

_____

_____

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

_____

Sample B:

Yes	No	Key Identifying Feature	Question
☐	☐	**Clasts**	**Can you see clasts in this sample?** **If yes, are the clasts all the same size?** **☐ Yes ☐ No** **If yes, are the clasts angular or rounded?** **☐ Angular ☐ Rounded**
☐	☐	**Strata**	**Can you see clearly defined layers in this sample?**
☐	☐	**Fossils**	**Can you see fossils in this sample?**

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

_____

_____

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

_____

Sample C:

Yes	No	Key Identifying Feature	Question
☐	☐	**Clasts**	**Can you see clasts in this sample?** **If yes, are the clasts all the same size?** **☐ Yes ☐ No** **If yes, are the clasts angular or rounded?** **☐ Angular ☐ Rounded**
☐	☐	**Strata**	**Can you see clearly defined layers in this sample?**
☐	☐	**Fossils**	**Can you see fossils in this sample?**

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

_____

_____

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

_____

Igneous Rock Lab

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.

Sample A:

Characteristic		
Color	☐ Light Colored	☐ Dark Colored
Density	☐ Low Density	☐ High Density
Texture	☐ Coarse Grained	☐ Fine Grained	☐ Glassy Texture

Yes	No	Key Identifying Feature
☐	☐	Does this igneous rock have a glassy texture?
☐	☐	Are the grains interlocked?

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

_____

_____

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

Sample B:

Characteristic		
Color	☐ Light Colored	☐ Dark Colored
Density	☐ Low Density	☐ High Density

Texture	☐ Coarse Grained	☐ Fine Grained	☐ Glassy Texture

Yes	No	Key Identifying Feature
☐	☐	Does this igneous rock have a glassy texture?
☐	☐	Are the grains interlocked?

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

_____

_____

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

Sample C:

Characteristic		
Color	☐ Light Colored	☐ Dark Colored
Density	☐ Low Density	☐ High Density

Texture	☐ Coarse Grained	☐ Fine Grained	☐ Glassy Texture

Yes	No	Key Identifying Feature
☐	☐	Does this igneous rock have a glassy texture?
☐	☐	Are the grains interlocked?

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

_____

_____

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

Metamorphic Rock Lab

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.

Sample A:

Yes	No	Key Identifying Feature
☐	☐	Is this metamorphic rock foliated?
☐	☐	Does this metamorphic rock have a distorted structure?
☐	☐	Are there any key metamorphic identifier minerals? ☐ Garnet ☐ Mica

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

_____

_____

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

Sample B:

Yes	No	Key Identifying Feature
☐	☐	Is this metamorphic rock foliated?
☐	☐	Does this metamorphic rock have a distorted structure?
☐	☐	Are there any key metamorphic identifier minerals? ☐ Garnet ☐ Mica

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

_____

_____

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

Sample C:

Yes	No	Key Identifying Feature
☐	☐	Is this metamorphic rock foliated?
☐	☐	Does this metamorphic rock have a distorted structure?
☐	☐	Are there any key metamorphic identifier minerals? ☐ Garnet ☐ Mica

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

_____

_____

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

Rock Identification Evaluation

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: _____