Life Science-Ms. Chica

Name: _____ Date: _____ Class: _____

Learning Objective: Students will be able to use the physical property of _____ to classify minerals by measuring and using a table.

Do Now: Describe the materials and procedure you would follow to determine the density of an object.

In order to identify minerals scientists use multiple tests to determine their **physical properties**. One of those tests includes determining the _____ of a mineral. Since I know that density is a set ratio of _____ per volume, I know that the density of the ***same*** type of mineral will always be the _____.

1. Under identical conditions, several samples of the mineral pyrite are measured, and their densities are compared. The values obtained should show that

   A. rounded samples are more dense than rough samples

   B. large samples are more dense than small samples

   C. small samples are more dense than large samples

   D. all the pyrite samples have the same density

2. The accompanying data table shows the mass and volume of four different minerals.

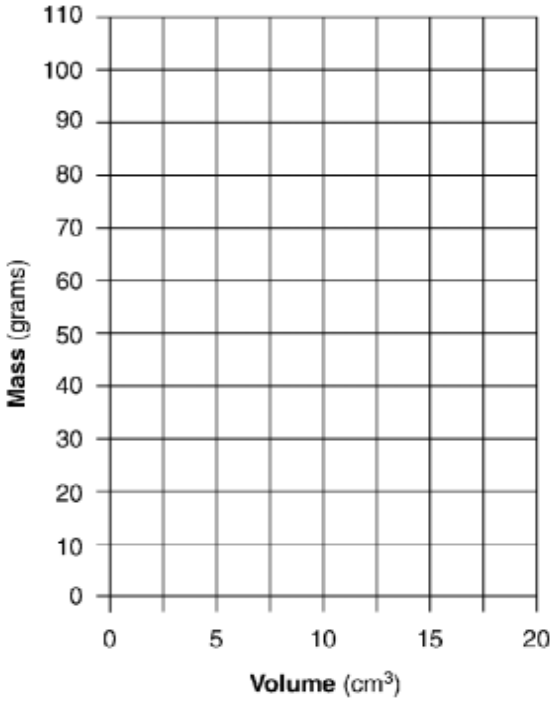
Mineral Sample	A	B	C	D
Mass	50 g	60 g	55 g	40 g
Volume	20 mL	15 mL	10 mL	5 mL

   Which mineral has the greatest density?

3. Base your answer(s) to the following question(s) on the data table below, which shows the volume and mass of three different samples, *A*, *B*, and *C*, of the mineral pyrite.

Pyrite		
Sample	**Volume (cm^3)**	**Mass (g)**
A	2.5	12.5
B	6.0	30.0
C	20.0	100.0

   On the grid below, plot the data (volume and mass) for the *three* samples of pyrite and connect the points with a line.



We Do:

1. Observe the mineral samples at your table. Write down any physical properties you can observe here:

2. Analyze the table below. Cross out any minerals in the table that you know **are not** your mystery mineral.

Data Table

Mineral	Properties				
	Surface Color	**Luster**	**Streak**	**Hardness**	**Density** (g/cm^3)
kaolinite	white	nonmetallic	white	soft	2.6
galena	silver to gray	metallic	gray black	soft	7.6
graphite	silver to gray	metallic	black	soft	2.3
magnetite	silver to black	metallic	black	hard	5.2
olivine	green	nonmetallic	white	hard	3.4

3. Using the graduated cylinder and triple beam balance, measure the mass and volume of your mystery mineral. Then, calculate density.

Mineral Sample	Mass	Volume	Density
Mystery Mineral #1			

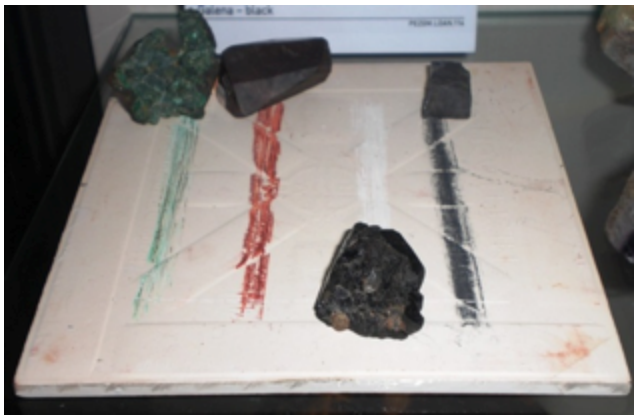
4. Using your calculations and the list of densities in the data table, identify your mystery mineral.

- Claim: Mystery Mineral #1 is a mineral named _____.
- Evidence: (What is your proof? What is your data?)
  _____
  _____
  ____
- Reasoning: (How do you know?)
  _____
  _____

Learning Objective: Students will be able to _____ and _____ the methods used to determine _____ and _____ of a mineral by writing procedures.

Even though the color of the mineral may look different on the outside,

Now You Try: Perform a streak test on the mineral at your table:



Mineral 2:
Was it scratched by:
Your fingernail?
_____
A penny?
_____
_____
Steel nail?
_____
___
Glass plate?
_____

__
Streak plate?

_____

_

What is mineral #2's hardness?

_____

_____

Base your answer(s) to the following question(s) on Moh's mineral hardness scale and the chart below showing the approximate hardness of some common objects.

Moh's Mineral Hardness Scale	
Talc	1
Gypsum	2
Calcite	3
Fluorite	4
Apatite	5
Feldspar	6
Quartz	7
Topaz	8
Corundum	9
Diamond	10

Approximate Hardness of Common Objects
Fingernail (2.5)
Copper penny (3.5)
Iron nail (4.5)
Glass (5.5)
Steel file (6.5)
Streak plate (7.0)

Which statement is best supported by this scale?

A. A fingernail will scratch calcite, but not quartz.

B. A fingernail will scratch quartz, but not calcite.

C. A piece of glass can be scratched by quartz, but not by calcite.

D. A piece of glass can be scratched by calcite, but not by quartz.

Data Table

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Identify the mineral that has the greatest difference between the color of its powder and the color of its outside surface. [1]

_____

Explain why a sample of magnetite will scratch a sample of galena. [1]

_____

_____

Scratch Test: *(used to test hardness)*

1. Select a fresh, clean surface on the mineral to be tested
2. Hold the specimen firmly and attempt to scratch it with the point of an object of known hardness.
3. Use the tool or index mineral to scratch the unknown mineral.
4. Use your finger to look for an etched line to determine if a scratch was made.
5. *You may need to repeat this process with multiple tools.*
6. Use Moh's Scale of hardness to determine the hardness of the unknown mineral.

· Describe how a streak test is performed?

_____

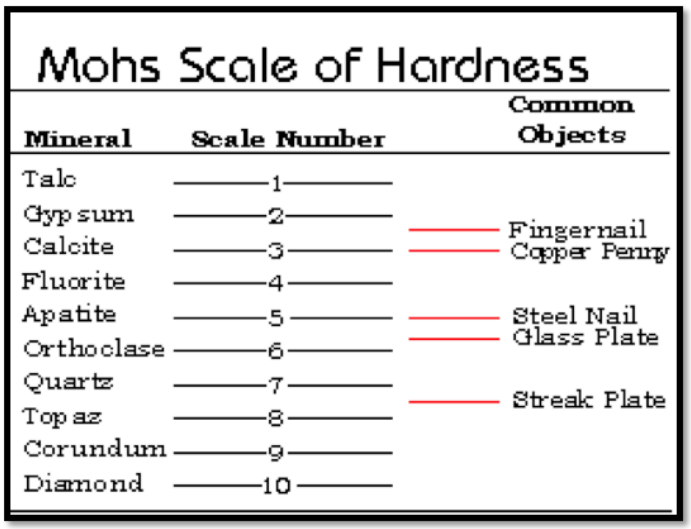
_____

_____.

What test is used to determine Hardness?

_____.

- What is the scale that is used to determine hardness? _____.
- What mineral is the softest?_____.
- What mineral is the softest?_____.



Properties of Some Minerals

Mineral	Properties		
	Hardness	Streak	Reaction with Acid
calcite	soft	colorless or white	bubbles
chalcopyrite	hard	gray or black	rotten-egg smell
feldspar	hard	colorless or white	no reaction
galena	soft	gray or black	rotten-egg smell
graphite	soft	gray or black	no reaction
gypsum	soft	colorless or white	no reaction
hornblende	hard	gray or black	no reaction

Identify the mineral in the table that is hard, has a black streak, and has no reaction with acid. [1]

_____

Compared to the chalcopyrite, which property of galena is different? [1]

_____

Describe the test for determining the streak of most minerals. [1]

_____

_____