Practice Packet
Topic 1: Prologue

Vocabulary: _____

Lesson 1: _____

Lesson 2: _____

Lesson 3: _____

Lesson 4: _____

Name: _____

Lesson 5: _____

Non-Science Vocabulary you MUST know to pass Earth Science

Part 1: Multiple Choice

1. Which of the following terms is used for the boundary between two things?

    1) Component   2) Interface   3) Determine   4) Orientation

2. Things that are unsorted or disorganized are best described as

    1) Concentrated   2) Resistant   3) Indicated   4) Random

3. Which of the following means "coming together"?

    1) Dominant   2) Converge   3) Deviation   4) Coordinate

4. The likelihood of an event is best described as its

    1) Gradient   2) Origin   3) Probability   4) Factor

5. Which of the following can mean "left behind"?

    1) Deposit   2) Exceed   3) Originate   4) Prevail

Part 2: Write the letter of the correct definition on the line for each word.

_____6. Severity	A.	The same
_____7. Frequency	B.	Estimated or guessed about
_____8. Predict	C.	How often something occurs
_____9. Deplete	D.	The degree to which something happens
_____10. Uniform	E.	To determine the future of something
_____11. Duration	F.	Many or the most
_____12. Ascending	G.	Increasing
_____13. Abundant	H.	To remove or reduce
_____14. Inferred	I.	What something is made out of
_____15. Composition	J.	Amount of time something take

ASSESS YOURSELF ON THIS LESSON: _____/15

VOCABULARY

For each word, provide a short but specific definition from <u>YOUR OWN BRAIN</u>! No boring textbook definitions. Write something to help you remember the word. Explain the word as if you were explaining it to an elementary school student. Give an example if you can. Don't use the words given in your definition!

Observation: _____

Inference: _____

Prediction: _____

Classification: _____

Measurement: _____

Instruments: _____

Density: _____

Mass: _____

Direct relationship: _____

Indirect (inverse) relationship: _____

Cyclic change: _____

Interface: _____

Dynamic equilibrium: _____

Rate of change: _____

Lesson 1 – What is Earth Science

Objective:
- I can name the four branches that make up Earth Science
- I can describe the four branches of Earth Science
- I can see the importance of studying Earth Science

Review:
1. The study of the solid earth is called
   a. geology.   b. oceanography.   c. meteorology.   d. astronomy.
2. The earth scientist most likely to study storms is
   a. a geologist.   b. an oceanographer.   c. a meteorologist.   d. an astronomer.
3. A meteorite lands in your backyard. Which earth scientist would you call to study the meteorite? Why?

Earth Science in Action

Three students, Alejandro, Barbara, and Cheryl, discovered a very unusual rock formation while hiking one day. Each student wrote a short summary about the discovery for their earth-science class.

Alejandro's Summary

During a hike through Jacob's Glen near Kenoza Lake we discovered an unusual rock formation. We were climbing up a hill that had bare rock on one side. Near the top, we saw a layer of black rock with gold crystals in it. This was the only rock on the hill that had any kind of crystal in it. We tried to chip off a piece of the gold crystal from the rock, but the crystals would not come loose. The rock itself was very hard and resisted chipping.

Barbara's Summary

We discovered a very unusual rock formation while hiking through Jacob's Glen on the south side of Kenoza Lake. We followed an old, dried-up stream bed through the glen. About 0.5 km south of Kenoza Lake we came upon a large hill. The north side of the hill was exposed, and the rock layers were visible. As we climbed the hill, we noticed that the rock layers were mostly light brown. About 10 m from the top of the hill, we came upon a layer of black rock. There were many gold-colored crystals throughout the rock. This seemed very unusual because all of the other rock layers were light brown layers with no visible crystals in them. The gold-colored crystals were cubic and had an average diameter of 0.5 cm. The rock was very hard, and the crystals would not break loose from the rock.

Cheryl's Summary

We found a very unusual rock formation while hiking through Jacob's Glen the other day. The hill near the old stream bed had an exposed side that showed the rock formations underneath. All the layers looked uninteresting except for a layer of black rock. The black rock layer had many gold crystals in it. The crystals were set tightly in the rock. We tried to pry them loose using a knife, but we had no luck. The rock itself was very hard. We tried to chip off a piece using other rocks, but none of them even scratched the black rock. The gold crystals in the rock were medium sized and round. They sparkled in the sunlight.

Your Turn to Think

1. Suppose you were a visiting scientist interested in locating this rock formation. Which student's summary would you use to find the rock formation? Explain your choice.

2. Both Alejandro and Cheryl reported that the rock formation contained gold crystals. Why did Barbara report that the rock had gold-colored crystals?

3. Why did the students try to break the rock?

4. What other facts would you have included if you had written the summary describing this rock formation?

Lesson 2 - Observation, Inference, & Classification

Objective:
- I can define Observation
- I can describe why we use Instruments
- I can define Inference
- I can describe Prediction
- I can describe Classification

Directions: Read the following passage & decide (a) what observations Inspector Richard's made & (b) what inferences were based on each observation.

Murder?

The rain had just stopped. Inspector Richards arrived at the house at 2 P.M. The front door was locked. He pried open the door & went in Mrs. Williams was lying in bed. She was dead. The bedroom window was open & there were several small puddles of water between Mrs. Williams's bed & the window. The woman was wearing a diamond necklace, & there was a bottle of pills on the night table near the bed. Mr. Williams was out of town on business.

Because Mrs. Williams was still wearing her diamond necklace, robbery could not have been the motive. It was obviously a case of murder. The murderer must have come in through the bedroom window & killed Mrs. Williams. The puddles of water were probably left by his shoes.

A. Observation

1. _____

_____

2. _____

_____

3. _____

_____

B. Inference

1. _____

_____

2. _____

_____

3. _____

_____

Directions: After reading the paragraph below, identify which of Pat's statements are observations (O) or inferences (I).

Pat received a present on the day before her birthday. The person who gave her the gift wrote on the box, "Not to be opened before your birthday." Pat, feeling she is older now, doesn't open the large box (3' x 3") but shakes it, listens to it, turns it over, but does not open the box.

1. The box is heavy. _____

2. There is something that sounds like it is rolling inside. _____

3. The gift must be big, because the box is so large. _____

4. The box is cold. _____

5. The gift is heavy. _____

6. The gift must be expensive, because it is big. _____

7. The box is square. _____

8. There is a ball inside the box. _____

9. The box is weathered, so it must have come a long way. _____

10. The box is green. _____

Directions: Study the drawing below, than write out your observations and inferences (possible hypotheses) about your observations.

1. Make observations about the picture.

   a. _____

   _____

   b. _____

   _____

   c. _____

   _____

2. Write inferences or hypotheses based on your observations.

   a. _____

   _____

   b. _____

   _____

   c. _____

   _____

What do you see in the images below?

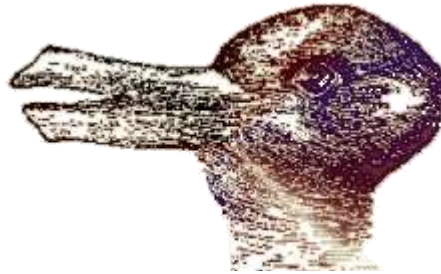**HINT**: There are 2 images in each picture!

_____

_____

_____   _____

_____   _____

Can you match each food at the bottom of the page with with his or her chosen dish? Examine their outfit's conditions and other visual clues.

1   2   3   4   5

6   7   8   9   10

FOODS

A   B   C   D   E

Pop

F   G   H   I   J

PRACTICE PACKET: TOPIC 1 PROLOGUE

1. In order to make observations, an observer must use
   a. Experiments
   b. Proportions
   c. The senses
   d. Mathematical calculations

1a. Examine the four options and pick one wrong answer. Describe why the answer is wrong.

_____

_____

2. A pebble found in a dry field has rounded edges. An instructor says that the pebble has been rolled over and over in a flowing stream. His comment can best be classified as
   a. An inference
   b. A fact
   c. A description
   d. An observation

2a. In your own words restate what the question is asking.

_____

_____

3. The general purpose of a scientific system of classification is to
   a. Make better interpretations
   b. Eliminate observations
   c. Organize for easier study
   d. State theories

3a. In your own words restate what the question is asking.

_____

_____

4. Which descriptive term illustrates an inference?
   a. Transparent
   b. Bitter
   c. Younger
   d. Smooth

3b. What two words go with Classification?

_____

_____

5. While on a field trip to a large lake in New York State, an observer recorded four statements about this lake. Which of these statements is most likely an inference?
   a. The lake was formed by glacial action
   b. The water is clear enough to see the bottom of the lake
   c. A log is floating in the lake
   d. The surface temperature of the late is 18.5°C.

4a. What do the words mean?

Descriptive: _____

Illustrates: _____

5a. In your own words restate what the question is asking.

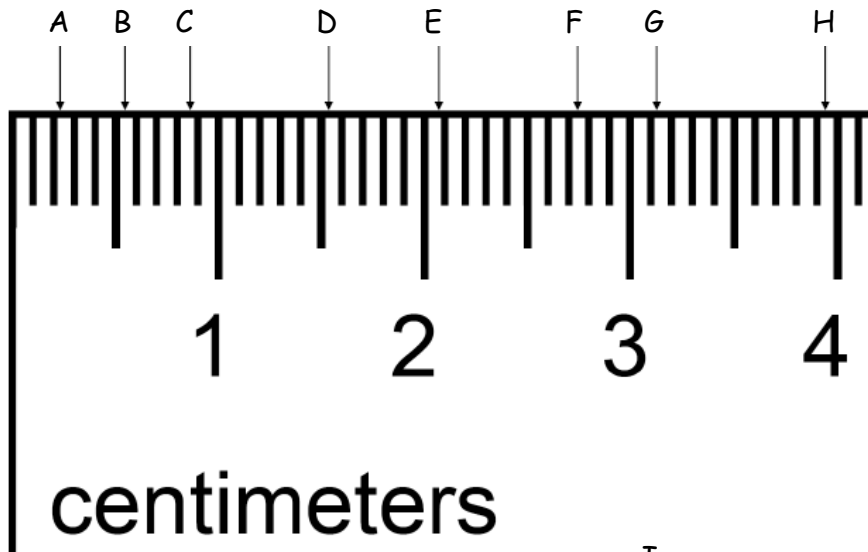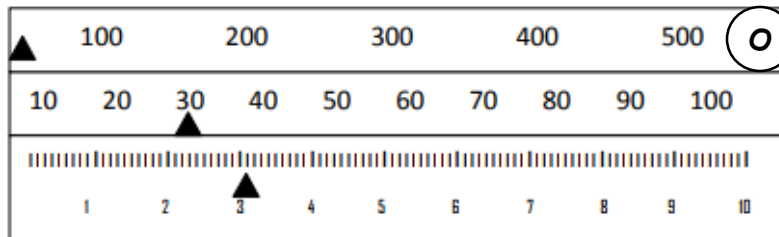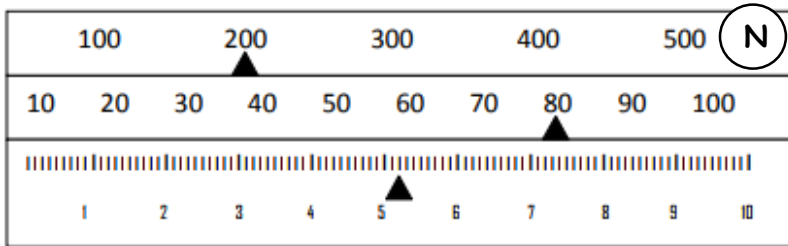Lesson 3 – Mass, Volume, Density & Measurement

Objective:
- I can define Measurement
- I can define Mass
- I can define Volume
- I can define Density
- I can use the Density triangle to find Mass, Volume, & Density Formulas

Directions: Record the measurements on the ruler, graduated cylinder & triple beam balance.

A B C   D   E   F G   H

1   2   3   4

centimeters

A: _____

B: _____

C: _____

D: _____

E: _____

F: _____

G: _____

H: _____

I: _____

J: _____

K: _____

L: _____

I   J   K   L

M

N

O

P

M: _____   N: _____   O: _____   P: _____

9
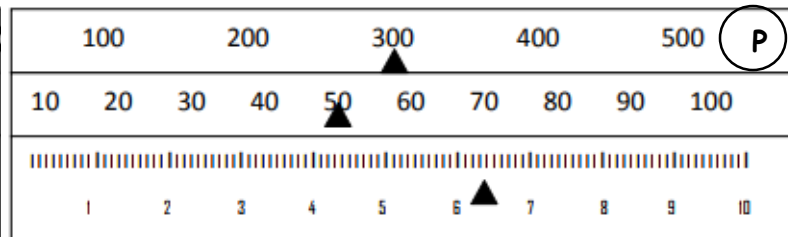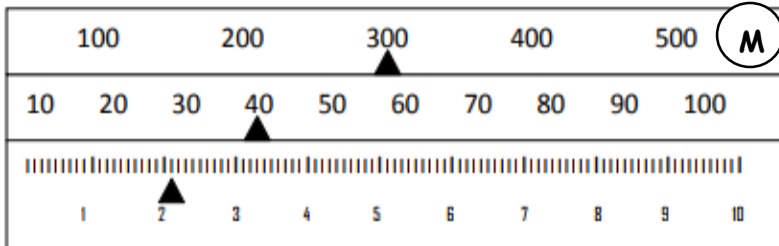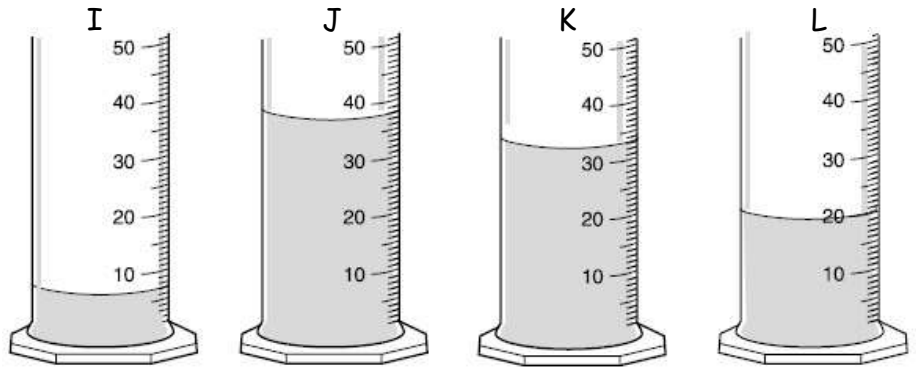
PRACTICE PACKET: TOPIC 1 PROLOGUE

Directions: For each problem below, write the equation and show your work. Always use units and box in your final answer.

1. If the mass of an object is 10 grams and its volume is measured to be 5 cubic centimeters, what is the object's density?

2. If the volume of a sample of pyrite is 2 milliliters and the object has a density of 5 g/ml, what is the mass of the sample of pyrite?

3. What is the mass of a 350 cm3 sample of pure silicon with a density of 2.336 g/cm3?

4. A student finds a rock on the way to school. In the laboratory he determines that the volume of the rock is 22.7 cm3, and the mass is 39.943 g. What is the density of the rock?

5. The density of lead is 11.342 g/cm3. What would be the volume of a 200.0 g sample of this metal?

**Directions:** Use the graph below to answer the following questions.
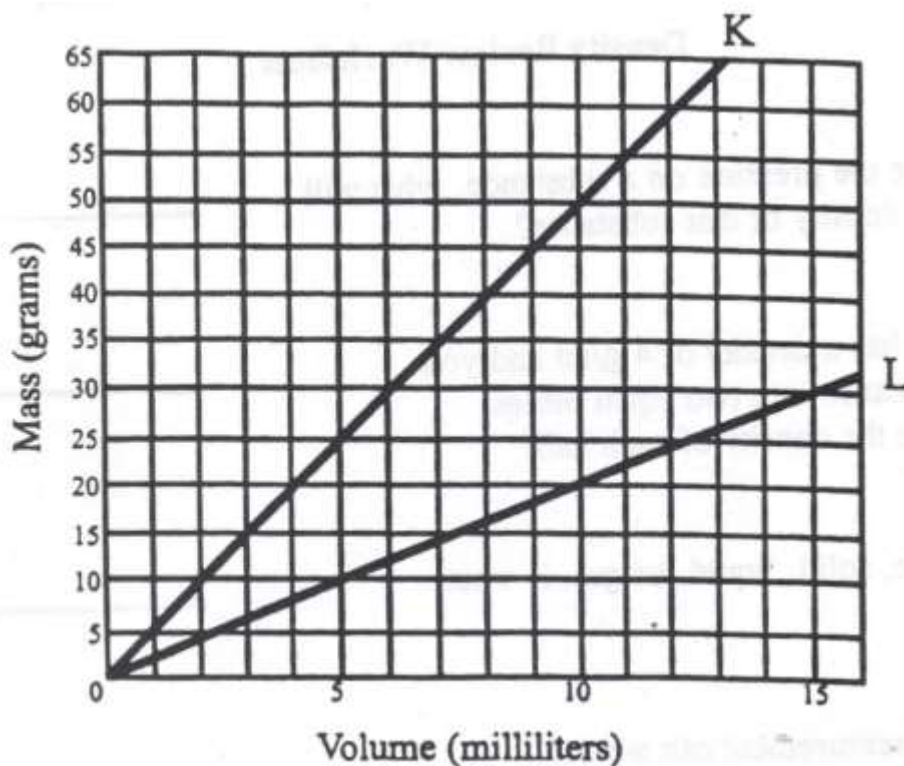
6. If the volume of substance K is 5 milliliters what is the mass of substance K?

7. What is the density of substance K?

8. If the mass of sample L is 23 grams, what is the volume of sample L?

9. What is the density of sample L?

10. If a sample of substance K has a mass of 75 grams, what would be the volume of that sample?

Directions: Plot three points on each line A-E & use those points to complete the charts below.

DENSITY

MASS (g) vs VOLUME (mL)

by Charles Burrows
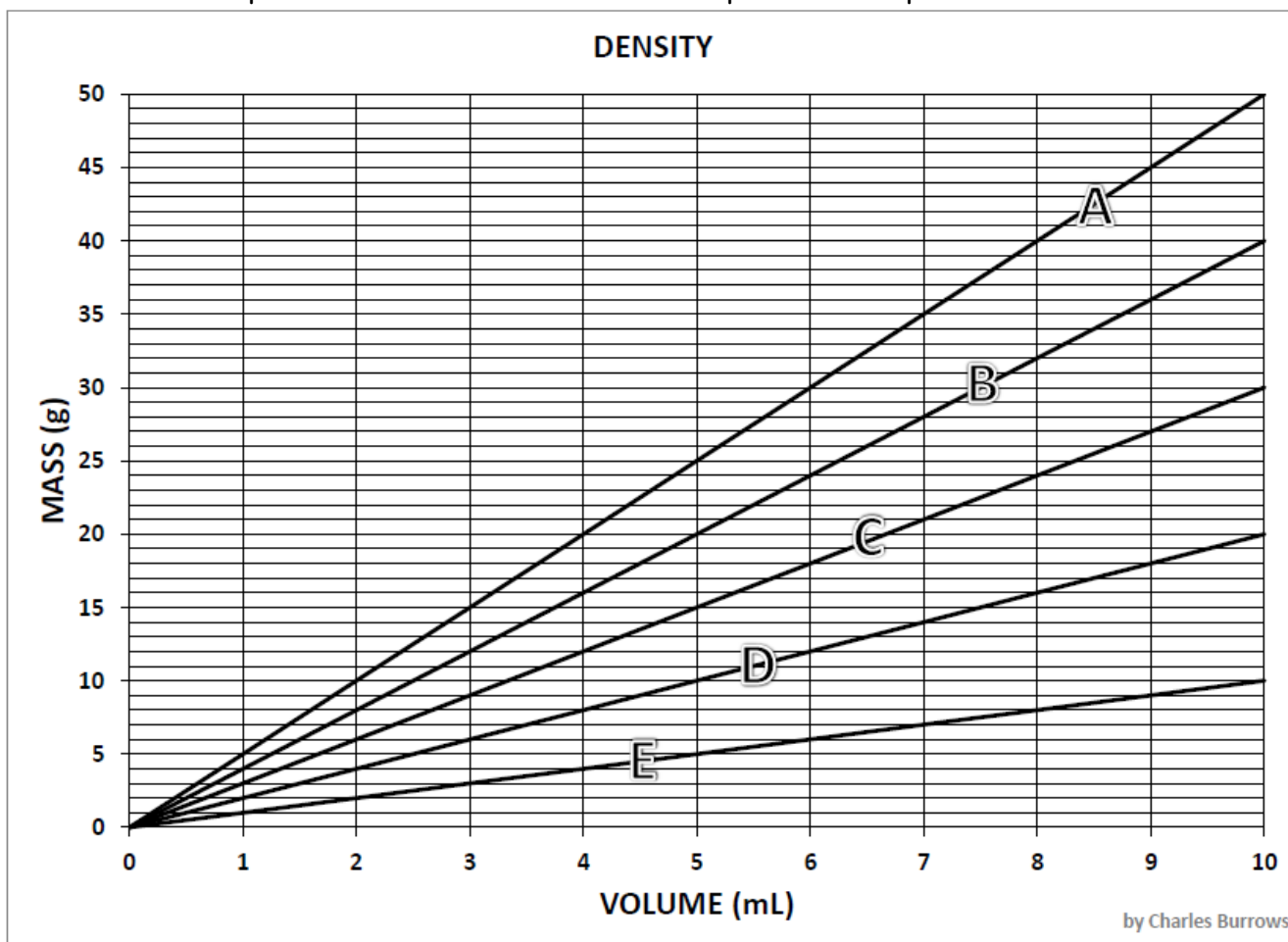
LINE A	Mass	Volume	Density
Point 1	g	mL	g/mL
Point 2	g	mL	g/mL
Point 3	g	mL	g/mL

LINE B	Mass	Volume	Density
Point 1	g	mL	g/mL
Point 2	g	mL	g/mL
Point 3	g	mL	g/mL

LINE C	Mass	Volume	Density
Point 1	g	mL	g/mL
Point 2	g	mL	g/mL
Point 3	g	mL	g/mL

ASSESS YOURSELF ON THIS LESSON: _____/27

If you missed more than 4, do the Additional Practice. If not, go on to the next hw video!!!

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LINE D	Mass	Volume	Density
Point 1	g	mL	g/mL
Point 2	g	mL	g/mL
Point 3	g	mL	g/mL

| LINE E	Mass	Volume	Density
Point 1	g	mL	g/mL
Point 2	g	mL	g/mL
Point 3	g	mL	g/mL

ASSESS YOURSELF ON THIS ADDITIONAL PRACTICE: _____/9
If you missed more than 2 you should see me for extra help and/or re-watch the lesson video assignment

Lesson 4 – The Concept of Density

Objective:
- I can find the relative density of an object.
- I can explain why density does not change based on size or shape.
- I can describe how temperature affects density
- I can describe how pressure affects density
- I can explain how phases of matter affect density

1. Generally, what phase of matter (solid, liquid or gas) has the lowest density? Highest?

2. Bubbles in soda rise to the surface. Explain this in terms of density.

3. The diagram below shows a glass jar containing a clear liquid and a floating rock. Which conclusion about the relative density of the rock and the liquid is true?
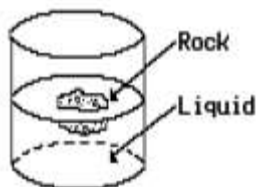
   a.   The rock and the liquid have the same density.
   b.   The rock is less dense than the liquid.
   c.   The rock is more dense than the liquid.

4. As water cools from 4°C to 0°C, its density
   a. increases
   b. decreases
   c. remains the same

PRACTICE PACKET: TOPIC 1 PROLOGUE

Questions 5 through 7 refer to the following: The graph above shows the mass and volume for five different samples of the mineral pyrite.
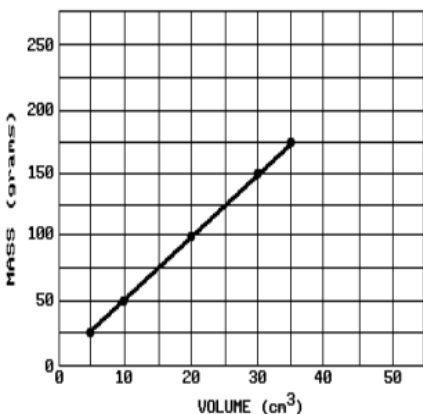

5. According to the graph above, the density of pyrite is about
   a. 0.5 g/cm3
   b. 2.5 g/cm3
   c. 7.5 g/cm3
   d. 5.0 g/cm3

6. If one of the original samples of pyrite were cut in half, the density of each half would be
   a. less than the original sample
   b. the same as the original sample
   c. greater than the original sample

7. If a sample of pyrite has a volume of 50 cm3, its mass would be
   a. 350 g
   b. 150 g
   c. 15 g
   d. 250 g

8. If the object is cut in half, the density of each piece will be
   a. greater than that of the original object
   b. the same as that of the original object
   c. less than that of the original object

9. The diagram below represents a cylinder which contains four different liquids, W, X, Y, and Z, each with a different density (D) as indicated. A piece of solid quartz having a density of 2.7 g/cm3 is placed on the surface of liquid W. When the quartz is released, it will pass through
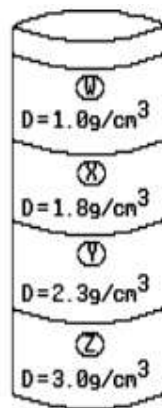
   a. W and X, but not Y or Z
   b. W, X, Y, and Z
   c. W, but not X, Y, or Z
   d. W, X, and Y, but not Z

10. As a volume of air expands due to heating, the density of this air will
    a. remain the same
    b. increase
    c. decrease

ASSESS YOURSELF ON THIS LESSON: _____/10
If you missed more than 4, do the Additional Practice. If not, go on to the next hw video!!!

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11. When a material is placed in a container of water, it sinks to the bottom. Compared to the density of water, the density of the material is
    a. Less
    b. The same
    c. Greater

12. If a cube was cut into four smaller cubes, the density of one of the small cubes, compared to that of the original cube, would be
    a. one-fourth as great
    b. the same
    c. four times as great
    d. one-sixteenth as great

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13. If this material is heated and expands, the density of the material will
    a. decrease   c. increase
    b. remain the same

14. If pressure is applied to a cube until its volume is one-half of its original volume, its new density will be
    a. one-half its original density
    b. twice its original density
    c. the same as its original density
    d. one-third its original density

15. The density of the material in a cube is determined at different temperatures and phases of matter. At which temperature and in which phase of matter would the density of the cube most likely be greatest?
    a. at 200°C and in the solid phase
    b. at 1800°C and in the liquid phase
    c. at 20°C and in the solid phase
    d. at 2700°C and in the gaseous phase

16. If the sphere is heated to a temperature below its melting point, which is most likely to occur?
    a. Both the volume and density of the sphere will increase.
    b. The volume of the sphere will increase, but it's density will decrease.
    c. The volume of the sphere will decrease, but it's density will increase.
    d. Both the volume and density of the sphere will decrease.

17. One sample of mineral B is heated until it melts. Compared to the density of the original sample, the density of the melted sample most likely will be
    a. greater
    b. the same
    c. less

Lesson 5 – Rate of Change

Objective:
- I can identify the dependent & independent variables
- I can describe a cyclic change
- I can use the rate of change formula

Wisconsin Man Gobbles up his 29,000th Big Mac
USA Today Dec 8, 2016

FOND DU LAC, Wis. — "Big Mac Daddy" Don Gorske reached yet another meaty milestone Thursday as he sat in his customary booth at McDonald's. You know, the one with his framed photo showcased on the wall above.

At about 5 p.m., the 63-year-old Fond du Lac resident of *Super Size Me* fame ate his 29,000th Big Mac sandwich, made up of "two all beef patties, special sauce, lettuce, cheese, pickles, onions on a sesame seed bun."

Gorske, who has held the Guinness world record for Big Mac consumption since 2001. "There must be something wrong with me, but it's still my favorite food,"

Obsessive-compulsive? Definitely, Gorske said. He once ate a Big Mac from Hawaii that a friend mailed to him. "I froze it and then I baked it in the oven for 15 minutes at 400 degrees. I figured if that didn't kill the germs, nothing would," he told action *Reporter Media* in 2011.

Gorske claims that after getting his first car on May 17, 1972, he headed straight to a McDonald's in his hometown. He bit into the burger, and something powerful took hold.

Since then, the former prison guard has made guest appearances on *Jimmy Kimmel*, *Rachael Ray*, *Lopez Tonight* and *Good Morning America*, to name a few, and was even the focus of a joke on *Saturday Night Live* and a question in the game "Trivial Pursuit." He is featured in the 2005 documentary *Don Gorske: Mac Daddy* and authored *22,477 Big Macs* in 2008.

Just recently, Gorske paid tribute to Big Mac inventor Michael "Jim" Delligatti, who passed away Monday at age 98. Normally, on that day of the week, Gorske would have taken a sandwich from his freezer stash and heated it up in the microwave.

Instead, he ate at his special spot at McDonald's and marked the occasion by holding up a photo of Delligatti while his wife took a snapshot for posterity. "This was strange for me, really weird, because it was also my birthday, and I got an email that day from Guinness saying my record still stands," Gorske said.

His wife, Mary Gorske, didn't partake with him. In fact, she doesn't much like meat but does insist he purchase a parfait of yogurt topped with fruit. "She told me I should eat something healthy, and she's a nurse," Gorske said. "I think it's paid off because I get a clean bill of health every year."

On Mondays, he usually purchases six Big Macs and four parfaits to last him through Wednesday, On Thursday, he purchases eight Big Macs and another four parfaits. He loves the taste of the burger microwaved, when all the flavors meld together just right.

A Big Mac contains 540 calories, with 28% fat, according to McDonald's. At one or two Big Macs per day and little else beside Coke and the low-fat parfait, he probably eats fewer calories than many people do. In fact, his cholesterol has never been over 160 mg/dL, he said, and he weighs in at around 200 pounds on a 6-foot, 2-inch tall frame.

If he lives as long as his dad, Gorske will have consumed 40,000 Big Macs when he turns 86. Wrappers and proofs-of-purchase cluttering his home will be evidence of his gastronomic legacy. "It's not something I obsess about, but I tell my kids that when I do go, they better know the count of the last Big Mac I've eaten."

Interesting, huh? That's a lot of all-beef patties, special sauce, lettuce, cheese, pickles, and onions on sesame seed buns! How fast did he eat them? Showing your work calculate his rate of consumption four times - per day, week, month, and year.

Rate of Change = --

Rate per Year	Rate per Month	Rate per Week	Rate per Day

A

D

B

C