Name: *Key* Period: ___________

Midterm 2017/18 Study Guide Date: ____________

Midterm Date: January 17, 2018

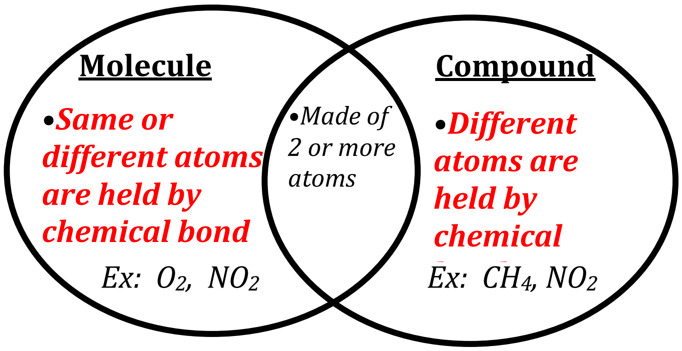
Format: 50 multiple choice questions

CHEMISTRY UNIT

Chapter 1: Matter (12 questions)

1. Matter does not have to be visible, but it must have these two properties:
   Mass and *Volume*

2. Complete the Venn Diagram to compare a Compound to a Molecule.



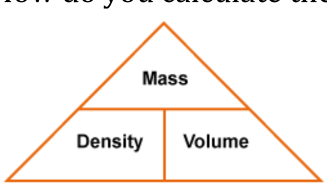
3. Complete the subatomic particle table below:

Particle	***Charge***	***Location in the atoms***
Proton	***+***	***Nucleus***
Neutron	***0***	***Nucleus***
Electron	***-***	***Electron Cloud***

4. What is the difference between a homogeneous mixture and a heterogeneous mixture?
   Homogeneous mixtures are evenly mixed (cannot see individual parts). Example: Salt water
   Heterogeneous mixtures you can see different parts. Example: Water and oil

5. How can you measure the **volume** of:
   a. An **irregularly shaped** object?
      Water displacement: Fill a graduated cylinder to a known volume. Next, drop the irregularly shaped object into the graduated cylinder. Record the volume of the water. Subtract the final volume of the water (with the irregularly shaped object) from the initial volume of water.
   b. A solid cube? ***L x W x H***

6. How do you calculate the **density** of an object?



Density = Mass/Volume

*You will need to calculate a density problem!

*KNOW your units (g/mL)

7. Large objects float because their ***Volume*** is bigger than their ***Mass***.

8. An object has a density of 2.0g/mL. If you put it in water (with a density of 1.0 g/mL) will it float or sink? Explain.
It will sink because its density is greater than water's density.

9. A **physical change** only changes the appearance of a substance while a **chemical change** changes ***the substance into a new substance***.

10. What's the difference between an endothermic reaction and exothermic reaction?
Endothermic reactions: Take in energy; Feel cold to touch; (Example: Ice melting)
Exothermic reactions: Releases heat; Feels warm to the touch; (Example: Campfire burning)

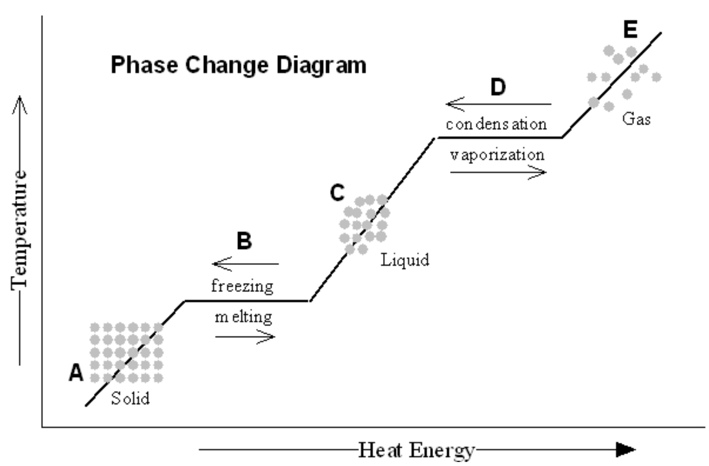
CHEMISTRY UNIT
<u>Chapter 2: Solids, Liquids, Gases (7 questions)</u>

11. Identify the state of matter described in each box below.

• Matter that has a definite volume but not shape. • Molecules slide past each other.	• Matter that has no definite volume and shape • Highest energy	• Matter that has a definite volume and shape. • Molecules are packed tightly
<u>Liquid</u>	***<u>Gas</u>***	***<u>Solid</u>***

12. Indicate the phase change below:
(WORD BANK: Sublimation; Deposition; Vaporization; Condensation; Melting; Freezing)
a. ***Melting*** the change from solid to liquid.
b. ***Freezing*** the change from liquid to solid.
c. ***Vaporization*** the change from liquid to gas.
d. ***Condensation*** the change from gas to liquid.
e. ***Sublimation*** the change from solid to gas.
f. ***Deposition*** the change from gas to solid.
g.

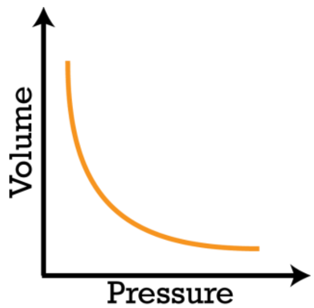
13. Use the phase change diagram to answer the following questions:



a) As you go from solid to liquid to gas, the thermal energy ***increases*** and the amount of space between particles ***move farther apart.***

b) As you go from a gas to liquid to solid, the thermal energy ***decreases*** and the amount of space between particles ***gets closer together***.

14. Refer to the graph below to answer the following questions. **Note: The Temperature is Constant!**



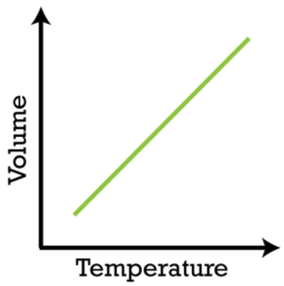
a) As Pressure Increases, Volume ***Decreases***

b) As Pressure Decreases, Volume ***Increases***

c) What Gas Law is demonstrated by the graph?

Boyle's Law.

15. Refer to the graph below to answer the following questions. **Note: The Pressure is Constant!**



a) As Temperature Increases, Volume ***Increases***

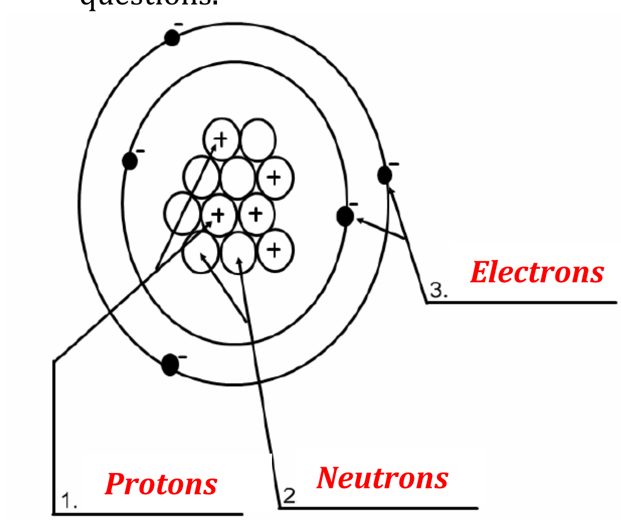
b) As Temperature Decreases, Volume ***Decreases***.

c) What Gas Law is demonstrated by the graph?

Charles's Law.

<u>Chapter 3: Periodic Table (5 questions)</u>

16. Label the subatomic particles on the atom and answer the following questions.



a) The number of protons equals the number of ***electrons*** in a neutral atom.

b) Which subatomic particle determines the identity of an element? ***protons***

c) Which subatomic particle has a neutral charge? ***neutrons***.

17. Identify the box below that describes a metal, non-metal, and metalloid.

a) Non-Metal	***b) Metal***	***c) Metalloid***
Brittle; Poor conductor; Oxygen is an example.	Very shiny; Reactive; Malleable; Corrodes; Silver is an example.	Mix of all characteristics, Semi-conductors; Boron is an example

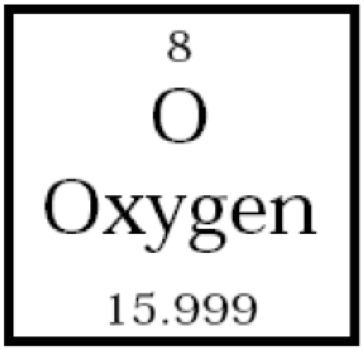
18. Refer to the element below.

   a. Label the *Atomic mass, Atomic symbol, Atomic number*

   b. How many protons? ***8*** How do you know? ***By the atomic number***

   c. How many electrons? ***8*** How do you know? ***By the atomic number***

   d. How many neutrons? ***8*** How do you know? ***Atomic Mass – Atomic number***



<u>Atomic #</u> = number of protons (which equals the number of eletrons)

<u>Atomic symbol</u>

____

<u>Atomic mass</u> = Protons plus neutrons

PHYSICS UNIT

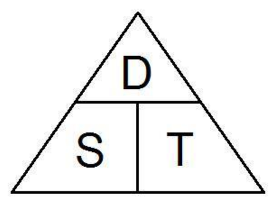
<u>Chapter 1: Motion (8 questions)</u>

19. Write the equation for speed, distance, and time using the speed triangle.

   a. Speed = ***distance divided by time***

   b. Distance = ***speed multiplied by time***

   c. Time = ***distance divided by speed***



20. How is speed different from velocity?

   Velocity includes the <u>direction</u> of the speed

   - ***Speed (25m/s)***
   - ***Velocity (25m/s west)***

21. The rate at which velocity changes is ***acceleration***

22. At the top of a hill, a roller coaster has a speed of 6m/s. 4 seconds later, at the bottom of the hill, its speed is 28m/s. What is its acceleration?

$$\frac{28\ m/s - 6 m/s}{4} = 5.5\ m/s^2$$

You will need to know this formula! $a = \frac{Vf - Vi}{t}$

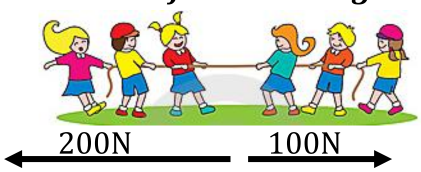
23. Match the correct definition with the correct type of acceleration.

A	When an object speeds up.	A. Positive Acceleration
C	When an object slows down.	B. No acceleration.
B	When an object has a constant speed.	C. Deceleration

24. Match the unit with the type of measurement they are used for:
    B m/s A. Acceleration
    C m B. Speed
    A m/s^2 C. Distance

<u>Chapter 2: Force (18 questions)</u>

25. A force is a ***push*** or a ***pull*** in a specific direction.
26. ***True/False:*** To find the net force of forces acting in the same direction, you would add them together.
27. ***Refer to the diagram below.***



- The forces shown to the left are PUSHING / PULLING forces.
- The forces are WORKING TOGETHER / OPPOSITE FORCES.
- The forces are BALANCED / UNBALANCED
- The net force is 200N LEFT / 100N RIGHT/ 100N LEFT / 200N RIGHT
- Motion is to the RIGHT / LEFT.

28. What is the net force for the forces below:

2N + 5N + 2N = 9N - 8N = 1N →

29. Unbalanced forces have a net forces ***greater*** than 0N and result in a change in ***motion***.

30. Give one real life example for each type of friction.
    a. Static: ***Pushing a heavy piece of furniture that does not move***
    b. Sliding: ***sledding down a snowy hill.***
    c. Rolling: ***Rolling a bowling ball down an alley***
    d. Fluid: ***Walking through a hurricane; swimming through water***

31. Which would have more sliding friction, an **ice cube** or a **rubber shoe**? ***Rubber shoe***

32. In order for objects to have a gravitational pull, they must have ***mass***.

33. It takes 4 seconds for a paperclip to fall to the floor. If acceleration due to gravity is $9.8 m/s^2$, what speed did the paperclip reach before hitting the ground?
    S = A (T) ***$9.8\ m/s^2 \times 4s = 39.2 m/s$***
34. If a bowling ball fell from the same height as the paperclip the problem above, then which would hit the ground first and what would the speed of the bowling ball be?
    They would hit at the same time (given that there is no air resistance).

35. ***True/False:*** Jupiter is much larger than Earth so you would have a greater mass on it.
    ****Mass would be the same!***
36. As you leave the earth and move toward Mars, Earths gravitational pull will ***weaken*** and Mars' gravitational pull will ***strengthen***.

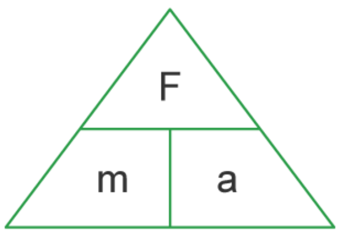
37. ***First law*** = An object at rest will ***remain*** at rest and an object in motion will ***remain*** in motion, unless acted upon by an ***outside*** force.

38. Give a real life example of Newton's first law.
In a car accident, when the car stops you continue to move forward until you are stopped by your seatbelt.

39. ***True/False:*** Inertia is an object's tendency to resist a change in motion.
40. The amount of inertia an object has depends on its ***mass***.

41. ***Second law:*** Acceleration depends on the net ***force*** and the ***mass*** of an object.

42. Use the Acceleration triangle to solve for Force, mass, and acceleration.



- Force: ***Mass x acceleration***
- Mass: ***Force divided by acceleration***
- Acceleration: ***Force divided by mass***

43. A net force of 302N is applied to a 28.6-kg box. Determine the acceleration of the crate.
302N/28.6kg = 10.6 m/s²

44. Two football players are pushing a coach on a sled. The mass of the sled and the coach is 300Kg. If the sled accelerates at $0.5 m/s^2$, then what is the net force applied by the two players?

$.5 m/s^2 (300kg) = 150N$

45. If the another coach jumped on the sled, the mass would go up and acceleration would ***decrease***.

46. If the players pushed harder, the net force would go up and acceleration would ***increases***

47. ***Third law:*** If one object exerts a force on another object, then the second object will exert a force of ***equal*** strength in the ***opposite*** direction.

48. Complete the action-reaction pairs for the pictures below: