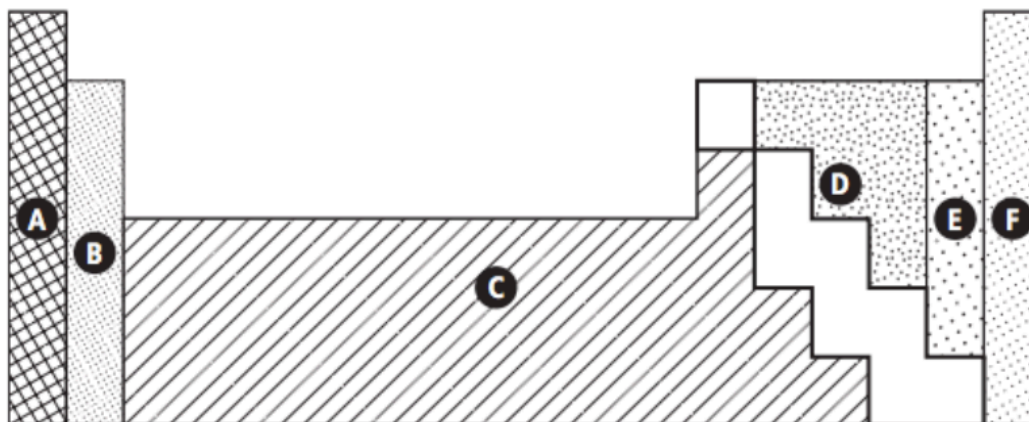


## Lab Skills

1. List the 6 steps of the scientific method.
  - i. Purpose
  - ii. Research
  - iii. Hypothesis
  - iv. Experiment
  - v. Analysis
  - vi. Conclusion
2. Identify the following as a qualitative or quantitative observation:
  - i. 5 cm high quantitative
  - ii. Moves 5 km/hr quantitative
  - iii. Colourless qualitative
  - iv. Green and blue qualitative
  - v. Feels slippery qualitative
  - vi. Tastes salty qualitative
3. You plant two apple trees in your backyard. They get the same amount of rain and sunlight. You give special fertilizer to only one of the apple trees to see if it helps it grow faster. Identify the independent and dependent variable in your experiment.
  - o Independent: Amount of fertilizer given
  - o Dependent: How fast the plants grow
4. Identify the following as true or false.
  - F You may eat and drink during a lab as long as you keep the food clean.
  - T Goggles must be kept in place until *everybody* has finished the lab.
  - F The teacher appreciates your imaginative additions to the lab; feel free to improvise.
  - F If a chemical gets in your eye, you must rinse your eye under the *faucet in the sink*.
  - F Most people will not be calm enough to remember to stop, drop and roll if their clothing is on fire.
  - F Always cut toward *yourself* when using a knife or razor blade.
  - T Your hands *cannot* be wet if you are handling electrical cords.

# Atomic Theory

1. Use the periodic table below to help answer these questions:



- Helium: A
- Nitrogen: D
- Vanadium: C
- Palladium: C
- Noble gases: F
- Magnesium: B
- Most reactive: A
- Least reactive: F
- Halogens: E
- Transition metals: C

2. Complete the following table:

Element Name	Element Symbol	Atomic Number	Atomic Mass	# of protons	# of neutrons	# of electrons
Titanium	Ti	22	48	22	26	22
Bromine	Br	35	80	35	45	35
Gold	Au	79	197	79	118	79
Bismuth	Bi	83	209	83	126	83
Oxygen	O	8	16	8	8	8

3. Define a subatomic particle:

Particles that make up an atom  $\Rightarrow$  3 types: protons, neutrons, electrons

4. What does the atomic number represent?

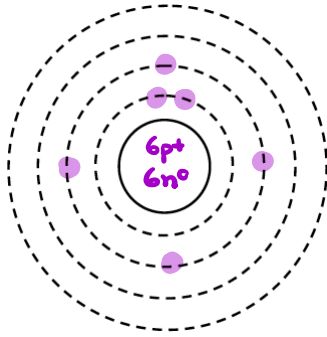
# protons

5. What does the atomic mass measure?

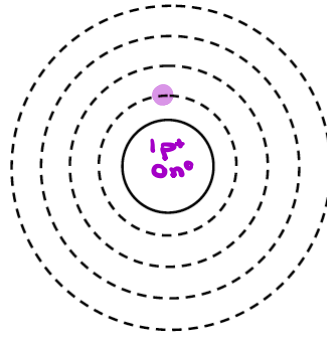
Atomic mass = # protons + # neutrons

6. Draw the Bohr diagram for the following elements:

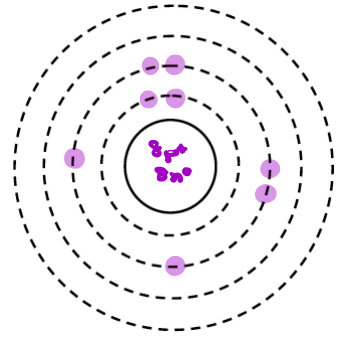
Carbon



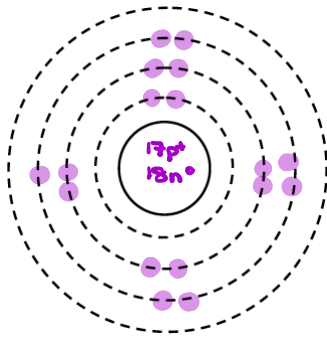
Hydrogen



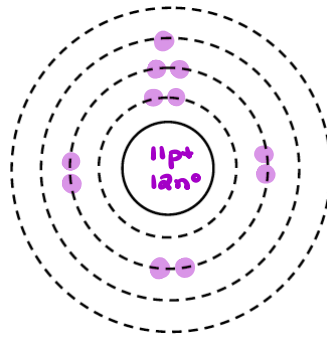
Oxygen



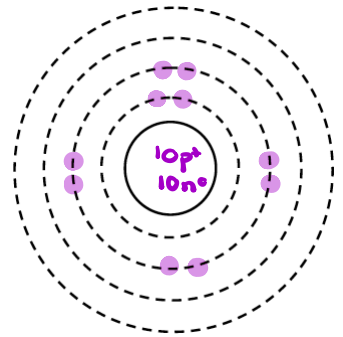
Chlorine



Sodium



Neon



7. Classify the following as an element, compound or mixture:

a) Water: Compound

f) Oxygen: Element

b) Silver: Element

g) Has different properties throughout:

c) Made up of only one kind of atom:

Mixture

Element

h) Magnesium: Element

d) Spaghetti sauce: Mixture

i) Is a pure substance and is made up of more

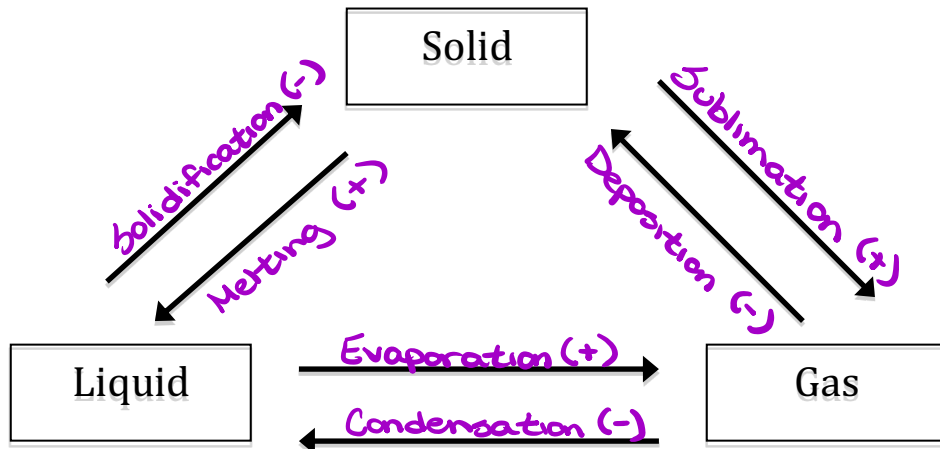
e) Can be heterogeneous or homogeneous:

than one kind of atom: Compound

Mixture

j) CO<sub>2</sub>: Compound

8. Label the following arrows for the phase change and indicate if heat is gained (+) or lost (-) in the diagram below:



9. In the Kinetic Molecular Theory:

- i. All matter is made up of very small particles
- ii. There is empty space between particles.
- iii. Particles are constantly moving.
- iv. Energy makes particles move.
- v. How does the space between particles change as energy/heat is added? Explain your answer.

As energy/heat is added, the space between particles gets larger and larger

↳ Atoms start to move faster and more collisions between atoms occur (more energy to move)

- vi. How does the space between particles change as energy/heat is lost? Explain your answer.

As energy/heat is lost, the space between particles gets smaller and smaller

↳ Atoms start to move slower and start moving closer together (less energy to move)

- vii. Define thermal expansion and thermal contraction. In your answer, provide an example of each.

Thermal expansion : when energy/heat is added, particles move faster & increases the space between particles  
= particles cover a larger area & the material expands in volume

ex: when a lid jar is hard to open, running the top with hot water allows the lid to expand & make it easier to open

Thermal contraction : when energy/heat is removed, particles move slower & decreases the space between particles

= particles cover smaller areas & the material decreases in volume

ex: when it is cold, the red mercury in a thermometer lowers due to thermal contraction