Science 9 Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Practice Test: Elements and the Periodic Table

1. What are the rules for writing a chemical symbol?

*First letter capitalised, second letter lower case.*  *If you see two capital letters, you are likely dealing with a compound (which is two or more elements)*

1. What makes up the mass of an element?

*Almost all of the mass is in the nucleus, which includes protons and neutrons.*

*Electrons do not account for much of the mass, but make up the vast majority of the volume.*

1. Name the three subatomic particles, their charges, and where they are found in the atom:

*Protons- positive and in the nucleus*

*Neutrons – neutral (no charge) and are also in the nucleus*

*Electrons – negatively charged and are found in electron shells surrounding the nucleus.*

*-the first electron shell can hold 2 electrons. If the first electron shell has 2 electrons, it is full and stable*

*- The second and third electron shells can hold up to 8 electrons. If it has 8, it is full and stable*

*If the shells are not fully stable, the element may form bonds with other elements.*

*Textbook page reference “Bohr’s Theory of the Atom” p. 209-210*

1. Classify the following as either a chemical change (C ) or physical change (P)

* Roasting a marshmallow - C
* Cooking an egg - C
* Lighting a candle - C
* Mixing gatorade crystals into water - P
* Whipping cream – P (it is still cream and air)
* Ripping paper - P
* Dissolving sugar - P

1. What are some of the indicators of a chemical change?

*Changes in colour, temperature, or energy is given off or taken (heat, light, etc.)*

1. Why are noble gases considered “stable”?

*Because they have full outer shells. As a result, they do not form ions and bond with other elements. All of the elements in the last column-or ‘family’- of the periodic table*

1. What is an electron shell?

*Electron “shells” are also known as orbitals, which represent different energy levels. Electrons arrange themselves around the nucleus on these ‘shells’ or ‘orbitals.’*

1. Why would elements give up or gain an electron?

*So that they can have stable outer shells. Elements want to have stable outer shells like the noble gases. They want stability. As a result, they will give up or gain electrons (whichever is easier) to have an electron arrangement much like the closest noble gas. I.e. Lithium will lose an electron so that it has an electron arrangement similar to helium. Whereas flourine will gain an electron to have an electron arrangement that is more like neon.*

1. What kind of ions do elements on the left side of the periodic table form?

*They form positively charged ions, because they are giving up electrons. When they give up electrons, they have more protons than electrons, which means they have an overall positive charge.*

1. What kind of ions do elements on the right side of the periodic table form?

*they form negatively charged ions, because they are taking electrons. When they add electrons to their structure, they have more electrons than protons and have an overall negative charge.*

1. What is a metalloid?

*It is an element which has properties that are similar to metals and non-metals. You will find them on the periodic table along a zig zag line.*

*-page referece 191 in textbook*

1. Why are halogens very reactive?

*Because they only need to gain one electron to have a full outer shell (they all have charges of 1-)*

1. Why are alkali metals and alkaline earth metals so reactive? Which ones are more reactive?

*Because they only need to give up one or two electrons to have a full outer shell.*

*Alkali metals are more reactive because they only need to give up one electron.*

*Alkaline earth metals are slightly less reactive because they need to give up two electrons. Think about it, it is easy to give up one Halloween candy. But TWO!? COME ON!*

1. Where is most of the mass of an atom?

*nucleus*

1. How do you determine the number of protons, electrons, and neutrons in an atom?

*Protons=atomic #*

*Neutrons = atomic mass – atomic #*

*Electrons = # of protons (IN AN ATOM)*

*Textbook reference p. 209-210 Bohr’s Atomic Theory of the Atom*

**For ions:**

Protons = atomic #

Neutrons = atomic mass – atomic #

Electrons = atomic # - charge (make sure you include the sign of the charge)

\*\*\*note that protons and neutrons do not change. When it comes to ions, the only thing that changes is the number of electrons.

*Textbook p. 214-216*

1. What is a compound? Provide a few examples:

More than one element bonded together

Carbon dioxide CO2, water H2O, methane CH4

1. What are some common characteristics of metals?

-*shiny , malleable, ductire, good conductors of heat and electricity, solid at room temperature, and usually more dense than non-metals.*

*-active metals react with acid, and very active metals react with water (think of our experiment where the calcium reacted with water)*

*-textbook page reference p. 190*

1. What are some common characteristics on non-metals?

-*p. 191 textbook*

*-dull appearance, often gases at room temperature, poor conductors of heat and electricity*

1. What is an atomic mass unit?

*The atomic mass unit is the unit in which we measure subatomic particles. For the sake of Science 9, what you need to know is that protons and neutrons are approximately 1 atomic mass unit.*

1. What are the horizontal rows in the periodic table called?  *A period*
2. What are the vertical columns in the periodic table called? *A group*