**Basic Chemistry** Name: Date: Period:

**Elements!** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Four elements make up 96%of biotic things!

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Elements have a *one or two letter symbol*. It’s an easier way to refer to them, like a nickname.

Some elements and their symbols:

**Atoms!**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Atoms are made of three particles:*

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**But where do all these particles live?**

The protons and neutrons live in the ­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The electrons \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ around the nucleus. Draw a picture of an atom here. Label the protons, neutrons, and electrons.

**Do protons, neutrons, and electrons get along?**

It depends on their charge!! Think of how magnets react when you try to put them together…

Positively charged things are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to negatively charged things.

So \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_!

Things that have *the same charges* are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ by each other.

So \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**How do we figure out how many of each atomic particle an element has?**

We can use the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which lists all the elements! It also lists very essential things about them such as….

Atomic \_\_\_\_\_\_\_\_\_\_ =

Element’s Symbol

Element’s Name

Atomic \_\_\_\_\_\_\_\_\_\_\_ =

6

**C**

Carbon

12.011

So the number of protons is equal to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Carbon has \_\_\_\_\_\_\_ protons, \_\_\_\_\_\_ electrons, and an average of \_\_\_\_\_\_\_ neutrons.

**Are electrons just floating around in space?**

Electrons are arranged into \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. They move around \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the nucleus.

The first shell can only hold \_\_\_\_ electrons.

The second shell can hold \_\_\_\_\_\_ electrons.

The third shell can hold \_\_\_\_\_\_ electrons.

When elements have full outer shells they are very STABLE. This is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The electrons in the outer shells are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ electrons.

**Charge!**

If an element has a **net charge** of zero (meaning it is neutral), then the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

*What happens if the number of electrons doesn’t equal the number of protons?*

This forms charged particles called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_!

Think about where the subatomic particles live. Which one can move around? \_\_\_\_\_\_\_\_\_\_\_\_\_\_

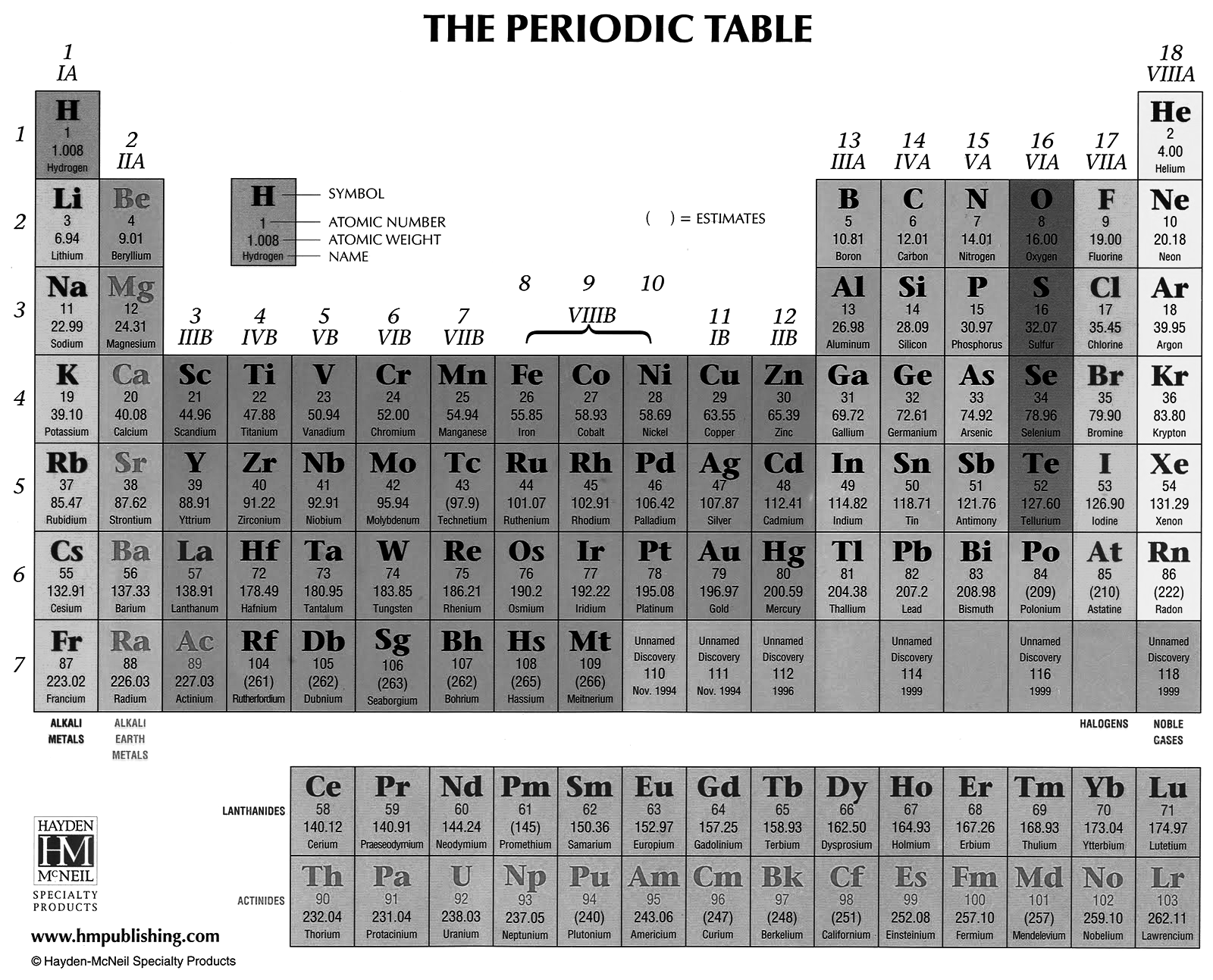
Sometimes electrons get \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_, or \_\_\_\_\_\_\_\_\_\_\_\_\_\_ between atoms!

So if an atom GAINS an electron, it has a net \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ charge.

(more electrons and fewer protons will make it -)

If an atom LOSES an electron, it has a net \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ charge.

(fewer electrons and more protons will make it +)



**Periodic Table Basics**

Bohr Diagram

Lewis Structure **B**

P= \_\_5\_\_

N= \_\_6\_\_

E=\_\_\_5\_\_

5

**B**

Boron

10.81

**Step 1: Complete the squares for each element by filling in the atomic number, name, and atomic mass.**

Write the atomic number at the top of the square.

Write the element’s name under the symbol.

Write the atomic mass at the bottom of the square.

**Step 2: Determine the number of protons, neutrons, and electrons in each element.**

Use your notes to help you. The number of electrons

are for a neutral element.

**Step 3: Create a Bohr diagram for each element.**

**Step 4: Draw the Lewis Structure for each element.**

**Step 5: Cut the cards apart and arrange according to atomic number in the pattern shown below. Once you have the cards arranged in the correct order, glue them to a sheet of paper or a large sheet of constructution paper.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **1** |  | | | | | | **2** |
| **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **11** | **12** | **13** | **14** | **15** | **16** | **17** | **18** |

**Step 6: Answer the questions on the next page using the information on your Periodic Table and your notes.**

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Period: \_\_\_\_\_\_\_\_\_\_**

**Getting to know the Periodic Table of Elements**

Answer the following questions in complete sentences once you have finished making your periodic table. Refer back to your notes for definitions and examples!

1. Which elements had complete outer shells? Give the name and symbol for each.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_

1. What do you notice about the location of the elements you listed in question 1?
2. Which elements had only one valence electron (electrons in the outermost shell)?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_

1. What do you notice about the location of the elements you listed in question 2?
2. What do you notice about the number of valence electrons as you move from left to right across a row or period in the periodic table? (Li 🡪Be🡪B🡪C🡪N🡪O🡪F🡪Ne)
3. Use your periodic table to predict the number of valence electrons for the following elements.

Calcium = \_\_\_\_\_\_\_\_\_ Lead = \_\_\_\_\_\_\_\_ Potassium = \_\_\_\_\_\_\_\_\_ Iodine = \_\_\_\_\_\_\_\_\_\_\_

1. What do you notice about the number of energy levels or shells as you move down a group or column in the periodic table? (H🡪Li🡪Na)
2. What is unique about hydrogen?

**The periodic table is organized in a very specific way and groups elements according to their physical and chemical properties.**

\_\_\_\_\_

**C**

\_\_\_\_\_\_\_\_\_

\_\_\_\_\_

Bohr Diagram

Lewis Structure **C**

P= \_\_\_\_\_

N= \_\_\_\_\_

E=\_\_\_\_\_

\_\_\_\_\_

**H**

\_\_\_\_\_\_\_\_\_

\_\_\_\_\_

Bohr Diagram

Lewis Structure **H**

P= \_\_\_\_\_

N= \_\_\_\_\_

E=\_\_\_\_\_

\_\_\_\_\_

**P**

\_\_\_\_\_\_\_\_\_

\_\_\_\_\_

Bohr Diagram

Lewis Structure **P**

P= \_\_\_\_\_

N= \_\_\_\_\_

E=\_\_\_\_\_

\_\_\_\_\_

**He**

\_\_\_\_\_\_\_\_\_

\_\_\_\_\_

Bohr Diagram

Lewis Structure **He**

P= \_\_\_\_\_

N= \_\_\_\_\_

E=\_\_\_\_\_

\_\_\_\_\_

**S**

\_\_\_\_\_\_\_\_\_

\_\_\_\_\_

P= \_\_\_\_\_

N= \_\_\_\_\_

E=\_\_\_\_\_

\_\_\_\_\_

**Mg**

\_\_\_\_\_\_\_\_\_

\_\_\_\_\_

P= \_\_\_\_\_

N= \_\_\_\_\_

E=\_\_\_\_\_

\_\_\_\_\_

**B**

\_\_\_\_\_\_\_\_\_

\_\_\_\_\_

Bohr Diagram

Lewis Structure **B**

P= \_\_\_\_\_

N= \_\_\_\_\_

E=\_\_\_\_\_

\_\_\_\_\_

**Li**

\_\_\_\_\_\_\_\_\_

\_\_\_\_\_

Bohr Diagram

Lewis Structure **Li**

P= \_\_\_\_\_

N= \_\_\_\_\_

E=\_\_\_\_\_

\_\_\_\_\_

**Ne**

\_\_\_\_\_\_\_\_\_

\_\_\_\_\_

Bohr Diagram

Lewis Structure **Ne**

P= \_\_\_\_\_

N= \_\_\_\_\_

E=\_\_\_\_\_

\_\_\_\_\_

**Na**

\_\_\_\_\_\_\_\_\_

\_\_\_\_\_

Bohr Diagram

Lewis Structure **Na**

P= \_\_\_\_\_

N= \_\_\_\_\_

E=\_\_\_\_\_

\_\_\_\_\_

**Ar**

\_\_\_\_\_\_\_\_\_

\_\_\_\_\_

Bohr Diagram

Lewis Structure **Ar**

P= \_\_\_\_\_

N= \_\_\_\_\_

E=\_\_\_\_\_

\_\_\_\_\_

**Si**

\_\_\_\_\_\_\_\_\_

\_\_\_\_\_

P= \_\_\_\_\_

N= \_\_\_\_\_

E=\_\_\_\_\_

\_\_\_\_\_

**Al**

\_\_\_\_\_\_\_\_\_

\_\_\_\_\_

P= \_\_\_\_\_

N= \_\_\_\_\_

E=\_\_\_\_\_

\_\_\_\_\_

**Cl**

\_\_\_\_\_\_\_\_\_

\_\_\_\_\_

P= \_\_\_\_\_

N= \_\_\_\_\_

E=\_\_\_\_\_

\_\_\_\_\_

**Be**

\_\_\_\_\_\_\_\_\_

\_\_\_\_\_

Bohr Diagram

Lewis Structure **Be**

P= \_\_\_\_\_

N= \_\_\_\_\_

E=\_\_\_\_\_

\_\_\_\_\_

**O**

\_\_\_\_\_\_\_\_\_

\_\_\_\_\_

Bohr Diagram

Lewis Structure **O**

P= \_\_\_\_\_

N= \_\_\_\_\_

E=\_\_\_\_\_

\_\_\_\_\_

**N**

\_\_\_\_\_\_\_\_\_

\_\_\_\_\_

Bohr Diagram

Lewis Structure **N**

P= \_\_\_\_\_

N= \_\_\_\_\_

E=\_\_\_\_\_

\_\_\_\_\_

**F**

\_\_\_\_\_\_\_\_\_

\_\_\_\_\_

Bohr Diagram

Lewis Structure **F**

P= \_\_\_\_\_

N= \_\_\_\_\_

E=\_\_\_\_\_