**Building Atoms and Molecules**

**Goals for the Day:**

1. Define an atom and its parts (subatomic particles: electron, proton, neutron)
2. Define a molecule
3. Compare and contrast an atom and a molecule

**Vocabulary Introduction:**

**Element:** A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_consisting of \_\_\_\_\_\_\_\_\_\_\_\_of atom.

**Atom:** The \_\_\_\_\_\_\_\_\_\_\_\_\_\_ unit of an \_\_\_\_\_\_\_\_\_\_\_\_\_ that can exist by itself.

**Subatomic Particles:** Units that are smaller than an atom. Some examples include \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Molecule:** A group of atoms bonded together.

**Instructions:**

1. Log on to computer and go to class website.
2. Open up the program “Build an Atom”.
3. Choose an element from your trading card project, build it, then answer the questions in this packet for the “Build an Atom” Activity.
4. Once you have finished building your atom and answering the questions, raise your hand to notify a teacher, they will check your work, then give you a molecule card.
5. Open up the program “Build a Molecule”.
6. Build a molecule that contains your element, then answer the questions in this packet for the “Build a Molecule” Activity.
7. Make sure all questions in the packet are answered, then turn in your packet to a teacher.

**“Build an Atom” Questions:**

Expand the symbol, mass number, and net charge boxes by pressing the green plus signs.

1. Add 1 electron in the atom. From the net charge, what is the charge of an electron? \_\_\_\_\_\_
2. Let’s look at the effect protons have on an atom.
3. Add 1 proton to the atom, what is the net charge? \_\_\_\_\_\_\_
4. Add 1 more proton to the atom, what is the new net charge? \_\_\_\_\_\_
5. Based on this information, what is the charge of a proton? \_\_\_\_\_\_\_
6. Now, add 1 neutron to the atom. By looking at the change in net charge, does a neutron have a charge, yes or no? \_\_\_\_\_\_\_\_
7. What atom have you made (given in the color red in the center circle)? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
8. By adding protons, electrons, and neutrons each time, try building the atom that is listed on your card (your atom needs to be stable and have 0 net charge).
9. Once you have built your atom and **it is stable with 0 net charge**, how many protons, electrons, and neutrons does it have?

Protons: \_\_\_\_\_\_\_\_\_\_\_\_ Electrons: \_\_\_\_\_\_\_\_\_\_\_\_ Neutrons: \_\_\_\_\_\_\_\_\_\_\_\_

1. What is the symbol for your atom? Fill in the blank boxes below:

**# of protons + Electric Charge**

**# of neutrons**

 **# of protons**

**\*Once you have finished all of the “Build an Atom” questions, raise your hand and ask a teacher to check your work before moving on to “Build a Molecule”.**

**“Build a Molecule” Questions:**

First we will practice by making water, H2O.

1. Drag 1 oxygen atom O to the blank screen. Then, drag 2 hydrogen atoms H directly on top of the oxygen atom. You have now made water! What does the “2” in H2O mean? \_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Now click Larger Molecules on the top of the page and go to kit #2. Try building the molecule written on your card. What is the name of your molecule? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Which elements make up your molecule? \_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_
4. Compare and contrast your atom and your molecule by completing the following table:

|  |  |  |
| --- | --- | --- |
|  | **Atom** | **Molecule** |
| **Name of atom/molecule** |  |  |
| **Does it contain elements? Yes/No** | Yes |  |
| **If yes, write which elements are present in the atom/molecule.** |  |  |
| **Does it contain subatomic particles? Yes/No** |  |  |
| **If yes, which subatomic particles are present?**  | Protons, neutrons, electrons |  |
| **Does it contain bonds? Yes/No** |  |  |
| **How many atoms are present?** |  |  |

**\*Once you have finished with the entire packet, if there is extra time in the period, go back to the “Build an Atom” simulation and play the game independently on your computers.**