PhET Atom Simulator

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Class: \_\_\_\_ Date: \_\_\_\_\_\_



**Part 1: Build an Atom**

Click on the + sign for each of the boxes (element name, net charge and mass number) to view changes as you change the number of particles in the atom.

Directions: Create a Helium (He) atom (2 protons, 2 neutrons, 2 electrons). Follow the directions, observe what happens and complete the table below. **(You need to RESET back to your original Helium (He) atom (2 proton, 2 neutrons, 2 electrons) after you make each change!)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Add a Neutron**(to original atom) | **Add an Electron**(to original atom) | **Add a Proton**(to original atom) |
| Observe and record ALL changes to the original Helium (He) atom when each subatomic particle is added! | **How does it change the:**Overall charge: \_\_\_\_\_\_\_\_\_Mass: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Atomic Number: \_\_\_\_\_\_\_\_Type of Atom: \_\_\_\_\_\_\_\_\_\_ | **How does it change the:**Overall charge: \_\_\_\_\_\_\_\_\_Mass: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Atomic Number: \_\_\_\_\_\_\_\_Type of Atom: \_\_\_\_\_\_\_\_\_\_ | **How does it change the:**Overall charge: \_\_\_\_\_\_\_\_\_Mass: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Atomic Number: \_\_\_\_\_\_\_\_Type of Atom: \_\_\_\_\_\_\_\_\_\_ |

Using your periodic tables, choose three elements (up to neon) and build their atoms using the simulator. Each atom must be **STABLE and NEUTRAL.** Fill in the information about them after you build each atom.

**Element #2: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

# of protons: \_\_\_\_\_\_\_

# of neutrons: \_\_\_\_\_\_\_

# of electrons: \_\_\_\_\_\_\_

Sketch:

Atomic #: \_\_\_\_\_\_\_

Atomic mass: \_\_\_\_\_\_\_

**Element #1: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

# of protons: \_\_\_\_\_\_\_

# of neutrons: \_\_\_\_\_\_\_

# of electrons: \_\_\_\_\_\_\_

Sketch:

Atomic #: \_\_\_\_\_\_\_

Atomic mass: \_\_\_\_\_\_\_\_\_\_

**Element #3: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

# of protons: \_\_\_\_\_\_\_

# of neutrons: \_\_\_\_\_\_\_

# of electrons: \_\_\_\_\_\_\_

Sketch:

Atomic #: \_\_\_\_\_\_\_

Atomic mass: \_\_\_\_\_\_\_\_

**Part 2: Atoms and ions and isotopes, oh my!**

 Play with the simulation to discover:

1. Which particle affects the **charge** of an atom or ion. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Which particle changes the **type of element** your atom is. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Which particle makes the atom an **unstable isotope** (make sure to check the box at the bottom that says stable/unstable). \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Atomic Number, Atomic Mass and Charge**

Play with the simulation to identify what each number signifies. Label the diagram below.



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

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

 **Design a stable Sodium atom. Design a stable Chlorine atom.**

Draw it in the box below after you make it on the Draw it in the box below after you make it on the Chromebook. Chromebook.

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**Part 3: Part 3:** Click **Game** at the bottom of the simulator window. Play the four games- can you get all ***five stars*** each time?!

