**Get There:**

* Google “phet Build an Atom” or follow this link: <https://phet.colorado.edu/en/simulation/build-an-atom>
* Click play to begin the simulation

**Begin by clicking on the “Atom” section of the simulation.**

**Part 1: What subatomic particle determines the type of element an atom will be?**

1. Drag and drop a proton into the nucleus of the atom. What element does the atom become?
2. Drag and drop a second proton into the nucleus of the atom. What element does that atom become?
3. Add a third proton. What element does the atom become?



1. Hit the “Clear” button to remove all the subatomic particles you just added.
2. Add a proton and a neutron to the nucleus. What element does the atom become?
3. Add a neutron to the nucleus. What element does the atom become?
4. Add another neutron to the nucleus. What element does the atom become?
5. Add another proton to the nucleus. What element does the atom become?
6. Add another proton to the nucleus. What element does the atom become?
7. Add an electron to the nucleus. What element does the atom become?
8. Add another electron to the nucleus. What element does the atom become?



1. Hit the “Clear” button to remove all the subatomic particles you just added.
2. What is the name of the following atoms?
	1. An atom with 3 protons and 4 neutrons: \_\_\_\_\_\_\_\_\_\_\_\_\_
	2. An atom with 2 protons and 4 neutrons: \_\_\_\_\_\_\_\_\_\_\_\_\_
	3. An atom with 4 protons and 4 neutrons: \_\_\_\_\_\_\_\_\_\_\_\_\_
3. Draw the atoms described below, showing protons, neutrons, and electrons:

|  |  |  |  |
| --- | --- | --- | --- |
| **Hydrogen: H** | **Carbon: C** | **Oxygen: O** | **Neon: Ne** |

1. What subatomic particle determines the type of element an atom will be?

Claim:

Evidence 1:

Evidence 2:

 Reasoning:

**Part 2: What subatomic particles determine the mass of an atom?**



1. Click the green “plus sign” button next to “Mass Number”.
2. Add protons, neutrons and electrons into the atom. Record 4 pieces of evidence from the simulation that might help to answer the question: “What subatomic particles contribute to the mass of an atom?” List them in the space below.
3. Write a full response to the question in a CER format in the space below.



1. Hit the “Clear” button to remove all the subatomic particles you just added.

**Part 3: How are electrons arranged in an atom?**

1. How many electrons can fit into the first energy level of an atom?
2. How many electrons can fit into the second energy level of an atom?



1. Hit the “Clear” button to remove all the subatomic particles you just added.