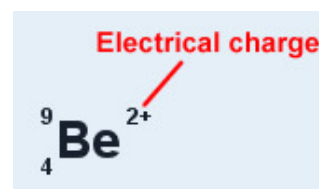
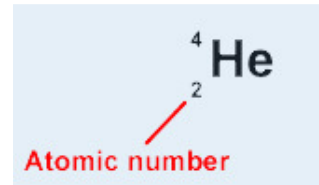
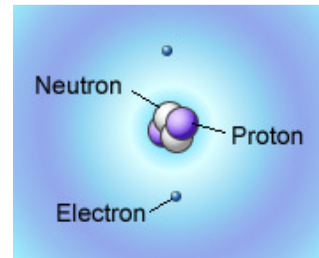



Vocabulary: Element Builder

Vocabulary

- **Atom** – the basic unit of matter.
 - An atom is the smallest particle of an element that still has all the properties of the element.
 - Atoms are made up of smaller particles called *protons*, *neutrons*, and *electrons*. The smaller electrons orbit around a central nucleus of protons and neutrons.
- **Atomic number** – the number of protons in the nucleus of an atom.
 - Elements are distinguished from one another by their atomic numbers.
 - For example, any atom with two protons is an atom of helium.
 - The symbol for the atomic number is Z.
 - In an element symbol, the atomic number is shown at lower left.
- **Electron** – a negatively charged particle that moves around the nucleus.
 - The mass of an electron is less than one thousandth of the mass of a proton.
- **Electron dot diagram** – a diagram that shows the element symbol surrounded by dots representing *valence electrons*.
 - For example, the electron dot diagram at right shows that neutral helium atoms have two valence electrons.
- **Element** – a pure substance that cannot be broken down into simpler substances by ordinary chemical means.
 - Elements are made of one type of atom.
 - Atoms of different elements are distinguished by the number of protons in the nucleus. For example, all carbon atoms have 6 protons.
- **Energy level** – a particular region where electrons can orbit a nucleus.
- **Ion** – an atom that has an electrical charge because it has gained or lost electrons.
 - An atom with more protons than electrons is a positively charged ion, or *cation*.
 - An atom with more electrons than protons is a negatively charged ion, or *anion*.
 - In an element symbol, the electric charge is shown at upper right.



- Isotope – one of several forms of the same element.
 - All isotopes of a given element have the same number of protons, but differ in the number of neutrons.
 - Most isotopes are *radioactive*. Usually only one or two stable isotopes exist for a given element.
 - Mass number – the number of protons plus neutrons in the nucleus of an atom.
 - Electrons also contribute to the mass of an atom. But, because their mass is only one thousandth of the mass of a proton or neutron, they are not counted in the mass number.
 - For example, the mass number of helium is 4 (2 protons and 2 neutrons).
 - The symbol for the mass number is A .
 - In an element symbol, the mass number is shown at upper left.
- Mass number


- Neutron – a particle with no charge located in the nucleus of an atom.
 - Neutrons have slightly more mass than protons.
 - The number of neutrons is described by the neutron number, N .
 - To find the number of neutrons, subtract the atomic number from the mass number.
 - Nucleus – the positively charged, dense center of an atom.
 - The nucleus contains protons and neutrons.
 - Periodic table – a chart that organizes the chemical elements based on their properties.
 - Proton – a positively charged particle located in the nucleus of an atom.
 - Protons have slightly less mass than neutrons.
 - The number of protons determines the element.
 - Radioactive – capable of releasing *radiation*.
 - In a radioactive atom, the nucleus can spontaneously decay and emit particles and/or light. These emissions are called radiation.
 - The energy released by radioactive substances can be harnessed to produce electricity in a nuclear power plant. This energy also can be used to create a massive explosion in a nuclear bomb.
 - If the emissions change the number of protons in the nucleus, the atom becomes a different element.
 - Valence electrons – electrons found in the outermost energy level of an atom.