**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 or molecule 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.
	+ 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.
* 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.