Name _____

2a ATOMS: THE BUILDING BLOCKS OF MATTER from the *Elements of Chemistry Series* Vocabulary Definitions

The following words and terms used in the program may be unfamiliar to you. Try to listen for these terms while viewing the program, pay close attention so you can later include them in your scientific descriptions, observations, and creative writing assignment activities.

alpha radiation - All radiation occurs when the nucleus of an atom decomposes to form a new nucleus. Alpha radiation consists of helium nuclei, two protons, and two neutrons.

atom - The fundamental unit of matter in the universe, made up of a nucleus of protons and neutrons and orbiting electrons.

atomic number - The number of an element is determined by the number of protons in its nucleus.

atomic mass - The mass of the element.

atomic mass unit (amu) - This is a measurement of the atomic mass. One amu is roughly equal to the mass of one proton.

beta radiation - Beta radiation occurs when high-speed electrons decompose from the nucleus.

Bohr, Niels - Danish physicist, 1885 - 1962.

DeBroglie, Louis - French physicist, 1892 - 1987.

electron - Negatively charged particle that orbits the nucleus of atoms.

element - An atom with a unique number of protons.

energy - In physics and chemistry, work, or the capacity to do work.

energy levels - Electrons orbit the nucleus of atoms with different levels of energy. These energy levels are sometimes called shells or levels.

fourth quantum number - Refers to the spin of the electron.

fission - When the nucleus of atoms are split apart, releasing energy.

fusion - When two hydrogen atoms fuse under extreme heat, energy is released. Fusion is the energy of the sun and stars.

gamma radiation - All radiation occurs when the nucleus of an atom decomposes to form a new nucleus. Gamma radiation is an energetic form of light similar to X-rays.

Heisenberg, Werner - German physicist, 1901 - 1976.

Hund's Rule of Maximum Multiplicity - Electrons fill the energy levels in regular patterns. They first fill the s orbitals, then the p, and so on.

hydrogen - The element with the atomic number of one and symbol of H. Hydrogen is the most common element in the universe.

ion - An atom with more or less electrons than protons.

isotopes - Atoms that have more or less neutrons than protons.

matter - Material that makes up objects. Matter cannot be created or destroyed.

mass - The total quantity of an object's matter.

neutron - Particles in the nucleus of atoms that have no electrical charge.

nuclear stability - An atom that is electrically neutral has an equal number of protons and electrons.

nucleus - The center of an atom.

orbitals - The shapes of the orbits of electrons.

oxidation numbers - Numbers indicating whether an ion has a positive or negative charge.

oxygen - An element with atomic number of 8 and symbol of O.

periodic table - The arrangements of elements according to their atomic number and group.

planetary model - The theory that electrons circle the nucleus of atoms like orbiting planets. Chemists and physicists abandoned this model when Quantum Theory was developed.

principle quantum number - Often referred to as "n." This number refers to the energy of the orbitals.

proton - Positively charged part of the nucleus of atoms.

quanta - Quantities of energy.

quantum numbers - Four numbers that describe the motion of electrons.

Quantum Theory - The theory that explains matter and energy at atomic and sub-atomic levels, sometimes called Quantum Mechanics.

quarks - Sub-atomic particles of matter. There are six different types of quarks but only two occur in the nucleus of atoms.

radioactive decay - Occurs when the original nucleus of an element decomposes to form a new nucleus, releasing radiation.

Rutherford, Earnest - British physicist (New Zealand), 1871 - 1937.

second quantum number - Refers to the shape of the orbital.

strong nuclear force - The force that holds the nucleus of atoms together. It is one of the fundamental forces of the universe.

third quantum number - Refers to the orientation of the orbital.

Thomson, J. J. - British physicist, 1856 - 1937.

transuranium elements - There are 92 elements found naturally in the universe. Several elements, with atomic numbers greater than 92, have been created under laboratory conditions. They are called transuranium elements.

Uncertainty Principle - The theory that it is impossible to know precisely the location and velocity of electrons at the same time.

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