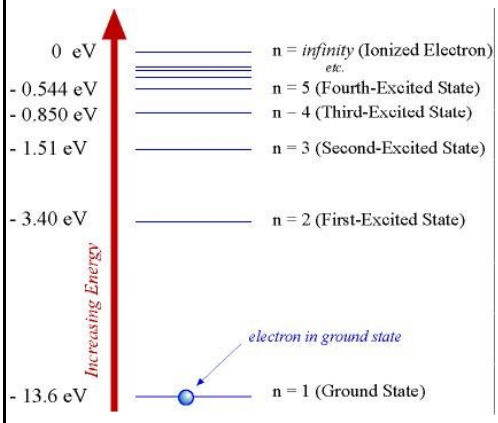
Vocabulary Atomic Structure and Periodicity

atom		**An atom is the smallest particle of an element that retains the chemical properties of the element. Atoms are electrically neutral, with a positively charged nucleus that binds one or more electrons in motion around it.**
atomic mass unit	**Also called: (amu,u) amu; dalton.**	**A unit of mass equal to 1/12 the mass of a carbon-12 nucleus, which is 1.660 538 73 × 10^{-27} kg ± 0.000 000 13 × 10^{-27} kg . Abbreviated as *amu* or *u*. Sometimes called the *dalton*, after John Dalton, architect of the first modern atomic theory.**
atomic number	**Also called: (Z)**	**The number of protons in an atomic nucleus. The atomic number and the element symbol are two alternate ways to label an element. In nuclide symbols, the atomic number is a leading subscript; for example, in $^{12}_{6}C$, the "6" is the atomic number**
atomic radius	metallic radius; covalent radius; atomic radii. Compare with ionic radius.	One half the distance between nuclei of atoms of the same element, when the atoms are bound by a single covalent bond or are in a metallic crystal. The radius of atoms obtained from covalent bond lengths is called the covalent radius; the radius from interatomic distances in metallic crystals is called the metallic radius.
atomic theory		**An explanation of chemical properties and processes that assumes that tiny particles called atoms are the ultimate building blocks of matter.**
Bohr model		**In atomic physics, the Bohr model depicts the atom as a small, positively charged nucleus surrounded by electrons in orbit - similar in structure to the solar system. Because of its simplicity, the Bohr model is still commonly used and taught today as a pedagogical simplification.**
chemical reaction	**reaction; chemical change**	**A chemical change is a dissociation, recombination, or rearrangement of atoms.**
E=hv	Planck's Relationship	Energy is equal to Planck's constant times frequency
electron		**A fundamental constituent of matter, having a negative charge of 1.602 176 462 × 10^{-19} coulombs ± 0.000 000 063 × 10^{-19} coulombs and a mass of 9.109 381 88 × 10^{-31} kg ± 0.000 000 72 × 10^{-31} kg [1998 CODATA values].**
electron configuration	**electronic configuration.**	**A list showing how many electrons are in each orbital or subshell. There are several notations. The subshell notation lists subshells in order of increasing energy, with the number of electrons in each subshell indicated as a superscript. For example, $1s^2\ 2s^2\ 2p^3$ means "2 electrons in the *1s* subshell, 2 electrons in the *2s* subshell, and 3 electrons in the *2p* subshell.**
electron energies		
excited state		An atom or molecule which has absorbed energy is said to be in an excited state. Excited states tend to have short lifetimes; they lose energy either through collisions or by emitting photons to "relax" back down to their ground states.

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Heisenberg uncertainty principle		A quantum mechanical principle due to Werner Heisenberg (1927) that, in its most common form, states that it is not possible to simultaneously determine the position and momentum of a particle. Moreover, the better position is known, the less well the momentum is known (and vice versa).
ion		**An atom or molecule that has acquired a charge by either gaining or losing electrons. An atom or molecule with missing electrons has a net positive charge and is called a cation; one with extra electrons has a net negative charge and is called an anion.**
magnetic quantum number	(m)	Quantum number that labels different orbitals within a subshell. m can take on values from - to +. The number of orbitals in a subshell is the same as the number of possible m values.
Millikan Oil Drop Experiment		This experiment was developed by Robert Millikan. It was designed to measure the charge on a single electron.
neutron	**(n, $^{1}_{0}$n)**	**An elementary particle found the atomic nucleus of all stable atoms except the hydrogen-1 atom. Neutrons have no charge and have a mass of 1.008665 Daltons.**
noble gas configuration		The noble gases are noted for their chemical stability and existence as mono-atomic molecules. They share a common electron configuration that is very stable. Except for helium, this configuration consists of 8 valence-shell electrons. valence e- He 2 Ne 8 Ar 8 Kr 8 Xe 8 Rn 8
orbital		**A wave function that describes what an electron with a given energy is doing inside an atom or molecule.**
photoelectric effect		Ejection of electrons from an atom or molecule that has absorbed a photon of sufficient energy. The photoelectric effect is the operating principle behind "electric eyes"; it is experimental evidence for particle-like behavior of electromagnetic radiation.
photons	(h) quantum; quanta.	A discrete packet of energy associated with electromagnetic radiation. Each photon carries energy E proportional to the frequency of the radiation: E = h, where h is Planck's constant.
proton	**(p^{+})**	**An elementary particle found the atomic nucleus with a positive charge equal and opposite that of the electron. Protons have a mass of 1.007276 Daltons.**
quantum	**quanta.**	**A discrete packet of energy.**
Rutherford Gold Foil Experiment		This experiment determined the basic structure of the atom. Although the basic structure has been modified since Rutherford did his experiment, the original conclusions still hold some validity. Rutherford's biggest contribution with this idea was to get the Chemistry community to start thinking about the structure of the atom in new ways.
s, p, d, f		**Notation for electron orbitals**
wavelength		**The distance between adjacent peaks (or adjacent troughs) on a wave. Varying the wavelength of light changes its color; varying the wavelength of sound changes its pitch.**

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