ORBITAL: area that you will find the electrons spinning around the nucleus, also called a SHELL

ELECTRON CONFIGURATION: each orbital or electron shell has certain limitations of size and numbers of electrons that can fit into each orbital. The configuration shows the electron number in each of the orbitals.

EXCITED STATE: electrons are in higher than normal orbitals or shells, due to an energy absorption
GROUND STATE: electrons are in the lowest energy level, in their normal orbitals or shells

ORBIT: Bohr thought that electrons flew around nucleus, like planets around the Sun, in a path.

QUANTUM: the exact amount of energy an electron needs to absorb to jump from one energy level to a higher energy level

PAULI EXCLUSION PRINCIPLE: Wolfgang Pauli determined that electrons in specific orbitals must have opposing spins.

PROTON: the positively charged particle in the nucleus with a mass of 1 amu
NEUTRON: the neutrally charged particle in the nucleus with a mass of 1 amu
ELECTRON: the negatively charged particle circling a nucleus, having nearly zero mass

NUCLEUS: the core of an atom, containing the protons and neutrons

SUB-ATOMIC: particles smaller than atoms: proton, neutron and electron; and smaller particles: quarks, leptons, mesons, bosons, muons, neutrinos, etc.

ATOMIC NUMBER: the number of protons (& electrons) in any atom is its atomic number

ATOMIC MASS: the sum in amu, of the neutrons and protons of an atom

ISOTOPE: chemically identical atom with a different number of neutrons. Average atomic masses are decimals because of the proportions of each type of isotope in an element. Each kind of isotope as a mass in whole amu.

ION: an atom that has a changed number of electrons. Atoms make ions to "get" an full outer orbital of electrons. Ions can be positive or negative.

CATION: a metal that has lost one or more electrons and is now positively charged
ANION: a nonmetal that has gained one or more electrons and is now negatively charged

BRIGHT LINE SPECTRA: When an electron gains enough energy the electron can jump to a higher energy level. When this electron loses that energy and falls back to the ground state, it emits this specific amount of energy which can be seen as light. Through refractive lenses, this mixture of light is broken into specific wavelengths, in a pattern of lines.

DALTON MODEL: John Dalton was the first modern scientist to create a model for the atom, he imagined it as a solid sphere, with each particular element made up of pure spheres particular to that element. Each sphere had a different mass, corresponding to the element's mass. Called the Billiard Ball Model.

THOMPSON MODEL: the second improvement in concept, JJ Thompson discovered the electron as a separate part of the atom, and imagined them floating in a solid positively charged lump. Called the "plum pudding" model.

RUTHERFORD MODEL: by using his famous gold foil experiment Ernest Rutherford determined that atoms are mostly empty space, that the nucleus was positively charged, and that the electrons flew around it. The first "real" atomic model with electrons flying outside the nucleus.

THE GOLD FOIL EXPERIMENT: Rutherford's classic experiment of shooting positively charged alpha particles at a this foil of pure gold. The particles mostly zoomed right through showing that the gold atoms were mostly empty space. Some bounced off at angles or even right back at the source, showing that when a small positive alpha particle hit the gold nucleus it did not stick (showing that the gold nucleus had a positive charge and was dense).

BOHR MODEL: Niels Bohr fixed Rutherford's problems of why don't the electrons fall into the nucleus when they lose energy from the flying around the nucleus. He determined that the electrons flew in specific paths, or orbits, like the planets around the Sun. These orbits were also energy levels. He said as long as they stayed in these orbits they'd not lose energy. Their speed and spin around the nucleus was enough to keep them from falling in. Orbits turned out to be wrong (great idea, but not fully correct).

WAVE MECHANICAL MODEL: (modern) It placed the electrons into "shells or orbitals", and most of these had sub-orbitals as well. The orbitals (or shells) are the zones, or areas of high statistical likelihood of finding the electrons. Electrons are not really in little orbits, but the shells/orbitals are still energy levels. This model was developed with math called quantum mechanics. It's a "statistical approach to locating electrons.

ENERGY LEVELS: also called electron orbitals or shells. These are the zones for electrons to fly around a nucleus

VALENCE electrons: the electrons in the highest energy level. He has a 2-2 configuration, meaning the first 2 electrons are in the first orbital. The next two are in the outermost orbital, which is the valence orbital. Lihas 3 electrons, a 2 - 1 configuration. Li has 1 valence electron.

NOBLE GASES: gases of group 18. They do not combine with the "peasant" atoms of the other elements. They tend not to bond into n aturally occurring compounds or molecules. They have complete or stable valence electron orbitals, making them unlikely to bond with other elements into compounds.

COMPLETE ORBITALS: the electron energy levels or orbitals are limited to specific numbers of electrons due to size and physics (charge and velocity, etc.). The maximum numbers of electrons in the first four energy levels are: 2, 8, 8 or 18, and 32.

HEISENBERG UNCERTAINTY PRINCIPLE: Werner Heisenberg proved mathematically that you could measure the velocity of an electron but never be able to determine its position, or, you could determine the position of a particular electron but then not be able to measure its velocity. Not on the regents exam either but way cool.