Atomic Theory Cheat Sheet

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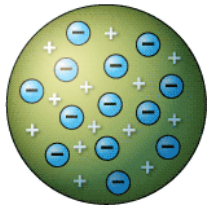
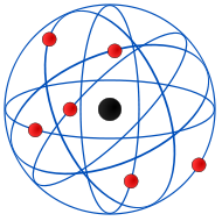
Dalton's Atomic Theory: 1808 Billard Ball Model

Postulates	Evidence	
1) All matter is made of atoms. Atoms are indivisible and indestructible.	Law of Conservation of Mass; observations suggested that the total amount of material before and after a chemical (or physical) change remained the same.	
2) All atoms of a given element are identical in mass and properties		
3) Compounds are formed by a combination of two or more different kinds of atoms.	Law of Definite Proportions: compounds have fixed mass ratios of elements of which they are always composed.	
4) A chemical reaction is a *rearrangement* of atoms.	Law of Multiple Proportions: when 2 elements form different compounds, ratios of elements between the two separate compounds are in simple whole numbers.	

Thomson's Atomic Theory: 1897 Plum Pudding Model

Postulates	Evidence	
1) An atom is a sphere of positively charged matter.	Cathode rays experiments and discovery of the electron; discovered cathode rays were a stream of negatively charged particles; measured their charge to mass ratio.	
2) Enough electrons are embedded within each atom to balance the charge thus making atoms electrically neutral.		
3) Larger atoms have more positive mass and more electrons, thus giving rise to the different elements.	The discovery of particles smaller than atoms suggested atoms were not the ultimate building blocks but had internal structure. The discovery of charges in the atom provided a mechanism for bonding.	

Rutherford's Atomic Theory: 1911 Nuclear Model

Postulates	Evidence	
1) Majority of atom's mass is in a dense, tiny, positively charge nucleus.	Gold foil experiment (alpha particle scattering) showed that alpha particles were encountering something massive and positively charged in the gold atom; frequency of encounters related to size and distance.	
2) Electrons orbit this nucleus much like planets orbit the sun.		
3) Most of the atom is empty space!		