

# Summary:

Atomic Structure has been an ever-changing topic since the first scientist began to ponder the nature of matter. Each step begins with a multitude of theories. Slowly these theories are tested, adjusted, scrutinized, and discarded by scientists around the world. Some prove to be true, while most seem to be only a piece of the puzzle. A science curriculum should include the key steps in significant theories. It should also contain the modern and more promising hypotheses of the time.

# References:

- Aristotle. Meteorology, 350 B.C., <http://classics.mit.edu/Aristotle/meteorology.1.i.html>
- Holt, Rinehart, and Winston. Modern Chemistry, 1986.
- Smoot, Smith, and Price. Merrill Chemistry, 1993.
- Smoot, Smith, and Price. Merrill Chemistry, 1995.
- <http://www2.slac.stanford.edu/vvc/theory/fundamental.html>
- <http://hepwww.ph.qmw.ac.uk/epp/glossary.html>
- <http://particleadventure.org/index.html>

Earth  
Air  
Fire  
Water

# The Nature of Matter

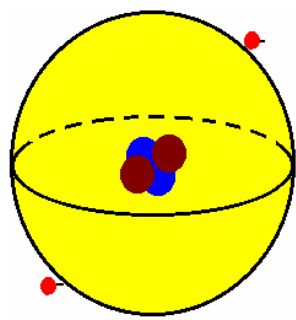
## Elementary Particles

Quarks	$u$ up	$c$ charm	$t$ top	Force Carriers	$\gamma$ photon
	$d$ down	$s$ strange	$b$ bottom		$g$ gluon
Leptons	$\nu_e$ electron neutrino	$\nu_\mu$ muon neutrino	$\nu_\tau$ tau neutrino	Force Carriers	$Z$ Z boson
	$e$ electron	$\mu$ muon	$\tau$ tau		$W$ W boson

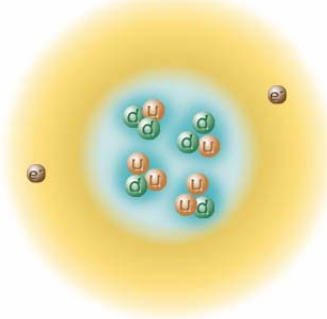
I II III

## Three Families of Matter

Yesterday's Atom



Today's Atom



Protons  
Leptons  
Positrons

$\Omega$   $\bar{u}$   $\Psi$   
Up Quarks Red  
 $\beta$   $\lambda$   $\mu$