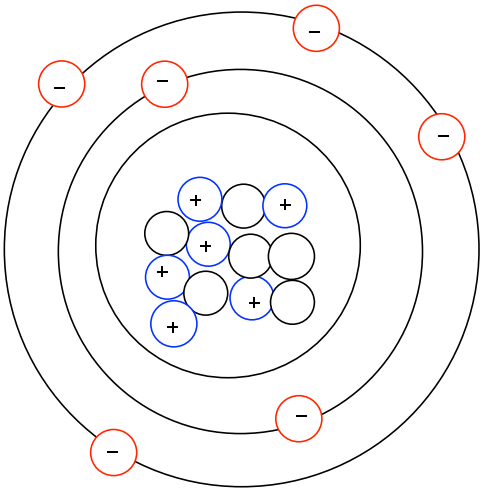
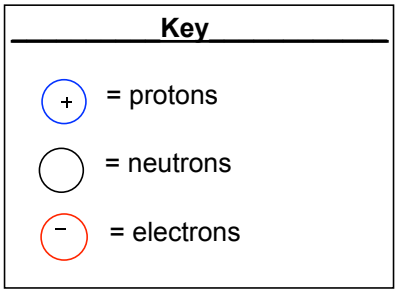
The Atom

Example: The Atomic Structure of Carbon-12





- The nucleus of the atom:
  - Contains protons and neutrons, each weighing 1 atomic mass unit (amu)
  - Protons are positively charged, and neutrons are neutrally charged. This makes the nucleus have an overall positive charge.
  - The sum of protons and neutrons determines the atomic weight
- The shells of the atom:
  - Contains electrons, which are negatively charged
  - The outermost shell is called the "valence shell" and contains "valence electrons" which are important in determining an atom's chemical behavior, bonding, and reactivity

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What Happens if You Change Different Elements of the Atom

Change to the Atom	What Happens	Example
Change in # of Protons	Changes the identity of the atom	Adding one proton to Carbon-12 (6 protons) makes it Nitrogen (7 protons)
Change in # of Neutrons	Creates an isotope, which are versions of the same element with different atomic weights	-Adding one neutron to Carbon-12 creates Carbon-13 -Adding two neutrons to Carbon-12 creates Carbon-14
Change in # of Electrons	Changes the charge of the atom, which creates an ion	-Add 1 electron to Carbon-12 creates a -1 charge (anion) -Remove 1 electron creates a +1 charge (cation)