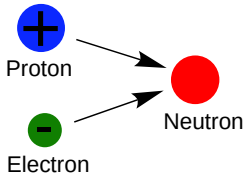
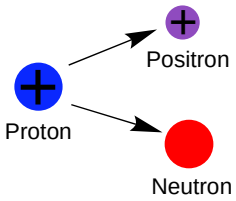
CONCEPT: ELECTRON CAPTURE & POSITRON EMISSION

- **Electron Capture:** unstable nucleus _____ (absorbs) an electron ($^{0}_{-1}e$) from the inner electron orbital.
  - □ Occurs in nuclei with excess number of protons; ____ # protons, ____ # of neutrons.
    - Proton and electron form a _____.



$^{131}_{55}Cs + {}^{0}_{-1}e \longrightarrow$ _____

- **Positron Emission:** unstable nucleus emits a *positron particle*.
  - □ **Positron Particle** is an _____particle of the electron, and is symbolized as: _____
    - When a positron and electron particles collide, both are annihilated and form ____ gamma rays.
  - □ Occurs in nuclei with excess number of protons; ____ # of protons, ____ # of neutrons.
    - Proton splits into a _____ and a positron.



$^{130}_{55}Cs \longrightarrow$ _____ $+ {}^{0}_{+1}e$

EXAMPLE: Write a nuclear reaction for each:

a) electron capture in Ir-189

b) positron emission in U-229

PRACTICE: Provide a daughter nuclide when Rn-215 undergoes 2 sets of alpha decay and a positron emission.

PRACTICE: Identify the missing species from the following nuclear reaction.

$$^{223}_{87}Fr \longrightarrow \_\_\_ + {}^{223}_{88}Ra \longrightarrow \_\_\_ + {}^{219}_{86}Rn$$