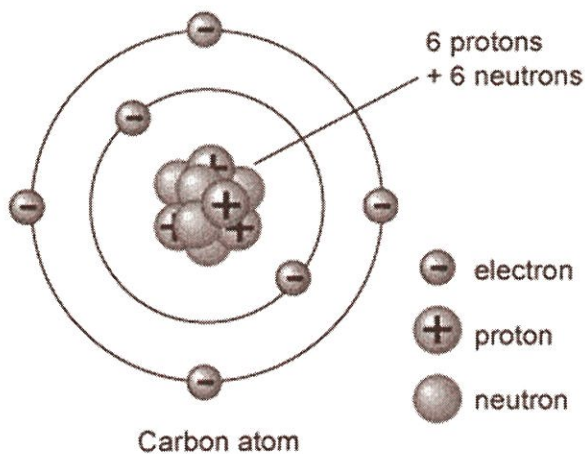


UNIT 7.1 Atomic Structure Review
 What makes an atom radioactive?



atomic # = 6
 mass # = 12

Atom: building blocks of matter

Subatomic Particles: particles that are smaller than atoms

Subatomic Particle	Mass	Charge	Location
Electrons	0	-1	orbiting around
Protons	1 amu	+1	nucleus
Neutrons	1 amu	0	nucleus

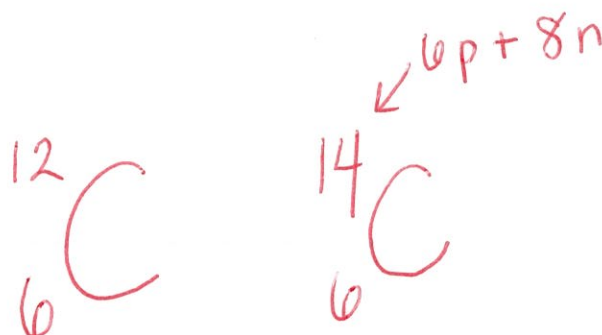
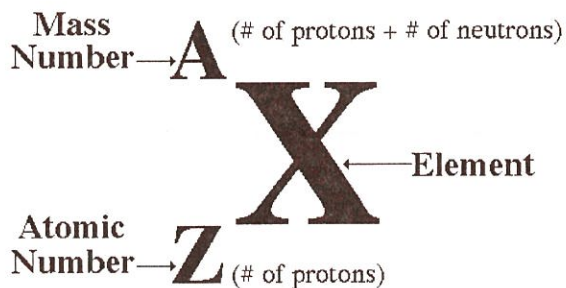
Nucleus: center of atom, contains protons and neutrons

Atomic Number: equal to the number of protons, identifies the element

Mass Number: equal to the number of protons plus the number of neutrons

Isotopes: atoms of the same element (same atomic number) but have different masses (different mass number)

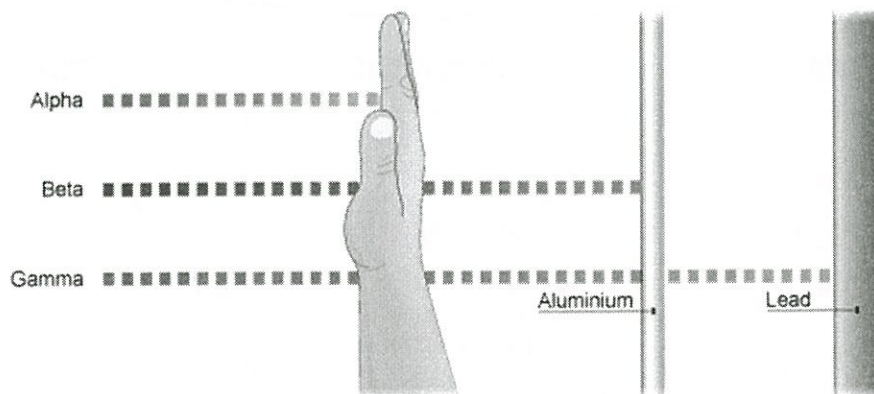
Isotopic Notation:



Radioactivity is a result of an **unstable** ratio of protons to neutrons in the nucleus.

Nuclear Processes

- often cause transmutation of elements (when an atom will change from one element to another)
- Nuclear decay
 - When something in the nucleus disintegrates (breaks down) giving off some form of radiation
 - Three types:
 - Alpha particle: helium nucleus (2 protons, 2 neutrons)
 - Beta particle: electron
 - Gamma particle: photon of light (energy)



UNIT
7.3

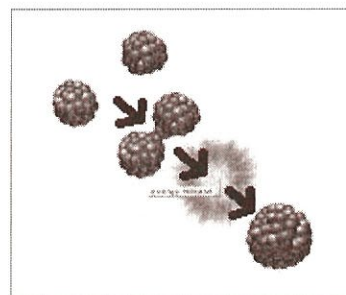
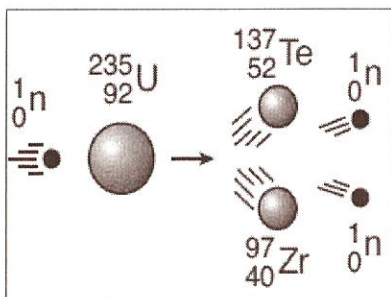
Nuclear Fission & Fusion

How has society used nuclear fission and fusion?

Perhaps the most well-known nuclear reactions are: fission and fusion. If your life is dependent on the sun continuing to burn, or you are aware of the existence of nuclear power plants or nuclear weapons, fission and fusion have already been a part of your life.

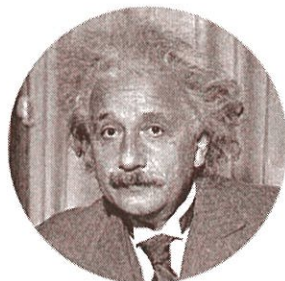
Fission is the division of atoms

Fusion is the union of atoms



Examples: nuclear reactors, atomic bomb

Examples: the SUN



$E = mc^2$

Fission and fusion reactions convert small amounts of

mass into large amounts of ENERGY

REWARDS

RISKS

REWARDS

RISKS

- cleaner energy than fossil fuels
- A LOT of energy produced

- nuclear waste is radioactive
- nuclear accidents

- 4x more energy than fission
- no longlived nuclear waste



fission

fusion