Where did the term radioactivity come from? (Name the scientists and the experiment they performed.

<u>Types of Radiation:</u> Draw the diagram of the experiment that separated radiation into three forms.

Characteristics of Ionizing radiation:

	Alpha radiation	Beta radiation	Gamma radiation
Composition			
Charge			
Mass (amu)			
Approx. energy			
Penetrating power			
Shielding			

An example of α radiation (transmutation from uranium to thorium via alpha decay):

238		234		4	
U	\rightarrow	Th	+	He	(alpha particle)
92		90		2	

An example of β radiation (transmutation from carbon to nitrogen via beta decay):



Two examples of gamma (γ) radiation:

230 Th 90	\rightarrow	226 Ra 88	+	4 He 2	+	γ	(transmutation of Thorium to Radium via alpha decay)
234 Th 90	\rightarrow	234 Pa 91	+	0 e -1	+	γ	(transmutation of Thorium to Protactinium via beta decay

Half-lives:

When the nuclei of atoms are unstable, the nucleus decays via alpha or beta decay. The time the radioactive material takes to decay is referred to as the half -life $(t_{1/2})$.

Half-life is defined as:



What are some pros and cons associated with nuclear fission?

Fusion:

(deuterium)

1 0 4 2 e \rightarrow He + energy! 4 H +2 -1 1 (beta particles) (alpha particle) (H nuclei) protons Another variation: 2 3 4 1 He n + energy! Η +Η + \rightarrow 1 1 2 0

(alpha particle)

(neutron)

What are some of the pros and cons associated with nuclear fusion?

(tritium)