Unit 10   NAME
Class Work   5/6/14

10.6 Half Life

SPARK
1. What is the mass of an alpha particle?
2. Write the nuclear decay equation for C-14

Objective

SWBAT complete calculations using the half life

Half Life Lab

- Follow the directions on your lab sheet.
- When you are finished, return all pennies to the ziploc bag and complete graph on the back

Objective: SWBAT complete calculations using the half life
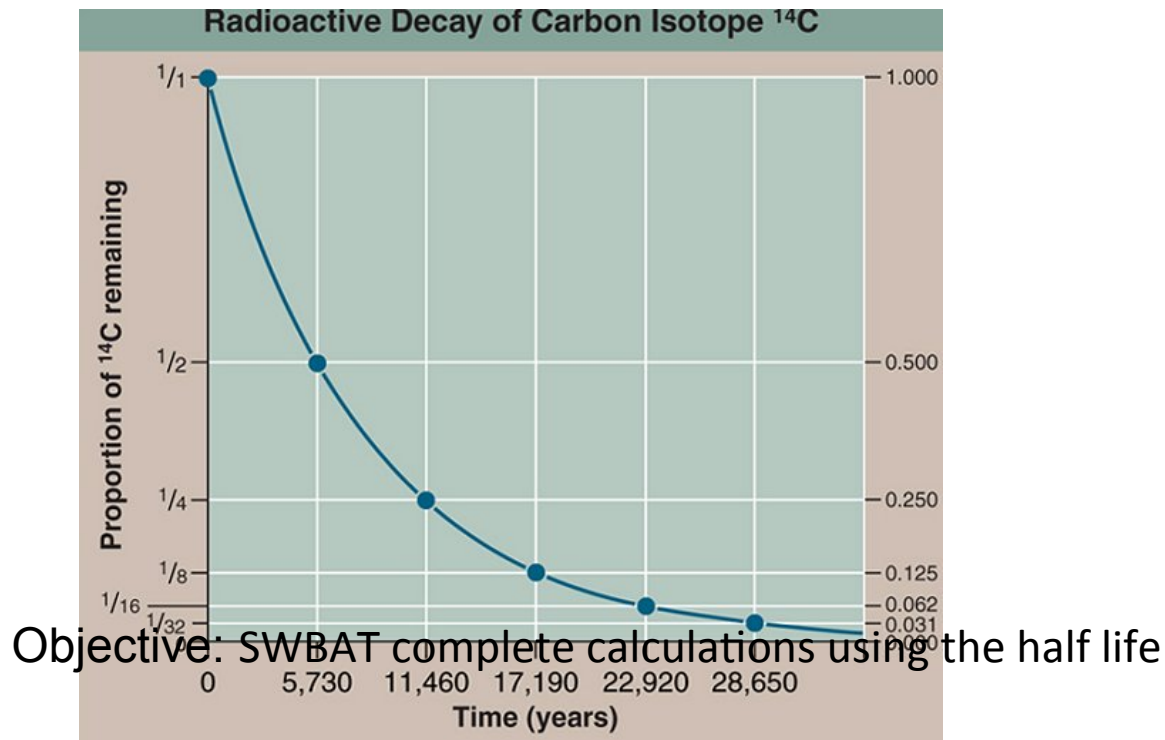
Half Life

- Time required for one half of a substance's initial amount to decay

- Examples:
  - Carbon-14 = 5715 years
  - I-131 = 8.021 days
  - U-238 = 4.47 x 10^9 years

Objective: SWBAT complete calculations using the half life

Half Life Graphs

- Graphing half-life shows that the substance decay is not a straight line (as you hopefully saw in your penny graph).

Radioactive Decay of Carbon Isotope ¹⁴C

Objective: SWBAT complete calculations using the half life

Why do we care?

• Radioisotopes with long half lives are used to date dead organisms.

Isotopic Age Dating

Method	Parent/Daughter Isotopes	Half-Lives	Materials Dated	Age Dating Range
Carbon (C)/Nitrogen (N)	C-14/N-14	5,730 yrs.	Shells, limestone, organic materials	100-50,000 yrs.
Potassium (K)/Argon (Ar)	K-40/Ar-40	1.3 billion yrs.	Biotite, whole volcanic rock	100,000-4.5 billion yrs.
Rubidium (Rb)/Strontium (Sr)	Rb-87/Sr-87	47 billion yrs.	Micas	10 million-4.5 billion+ yrs.
Uranium (U)/Lead (Pb)	U-238/Pb-206	4.5 billion yrs.	Zircon	10 million-4.5 billion+ yrs.
Uranium (U)/Lead (Pb)	U-235/Pb-207	710 million yrs.	Zircon	10 million-4.5 billion+ yrs.

• Radioisotopes with short half lives are used to fight medical disorders.

Objective: SWBAT complete calculations using the half life

Iodine-131 decay
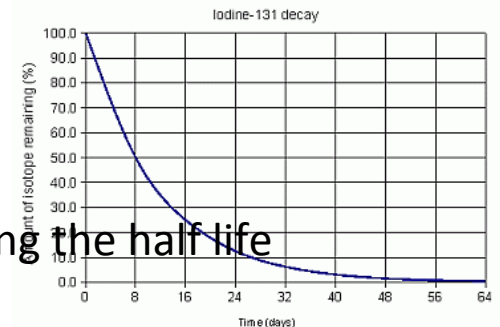
Practice!

- Using doc camera!

Practice

- Complete the rest of 10.6 Practice Sheet
- Complete the conclusion for Lab #24 (place in classwork bin!)

HOMEWORK

Work on rough draft of Nuclear Power Paper

Study ALL notes from Unit 10!

Complete online practice quizzes/review vocabulary!

Objective: SWBAT complete calculations using the half life