

Assignment: 5

Name: PILARZ-KEY

Hour: _____

Standard 8 Radioactivity- Review Sheet

Objective: Radioactivity Basics

1. What is radioactive decay?
particles or energy leaving an unstable atom
2. Put the three types of decay we learned about in order from weakest to strongest. What will protect you from each type?
weakest = alpha decay - sheet of paper
beta decay - wood
strongest = gamma decay - concrete or metal (lead)
3. Why is radiation harmful?
can cause cancer, death or other mutations
4. Why is radiation helpful?
can be used to cure cancer (more powerful, targeted)
5. Describe how the following terms relate to radiation:
 - a. Tracer - radioactive chemical that follows certain reactions inside living organisms
 - b. Background radiation - radiation that comes from the sun, stars, soil and building materials
 - c. Geiger Counter - device used to measure radiation (measure it in rem, rad or currie)

Objective: Fusion vs. Fission

*be prepared to know the difference based off a picture

1. What is the difference between fusion and fission?
fusion - joining of 2 nuclei to release energy
fission - splitting of a nucleus to release energy
2. What do we mean when we say fission is like a chain reaction?

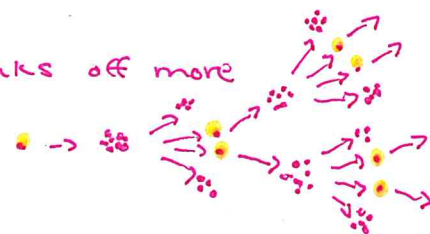
the neutron when splitting the atom breaks off more neutrons that then split more atoms...

3. Give an example of fusion and an example of fission.

fusion - stars fission - power plants, bombs

4. How have nuclear bombs been a part of United States history?

we've tested over 1,000 but only used them once on people (2 bombs) on Japan during WWII

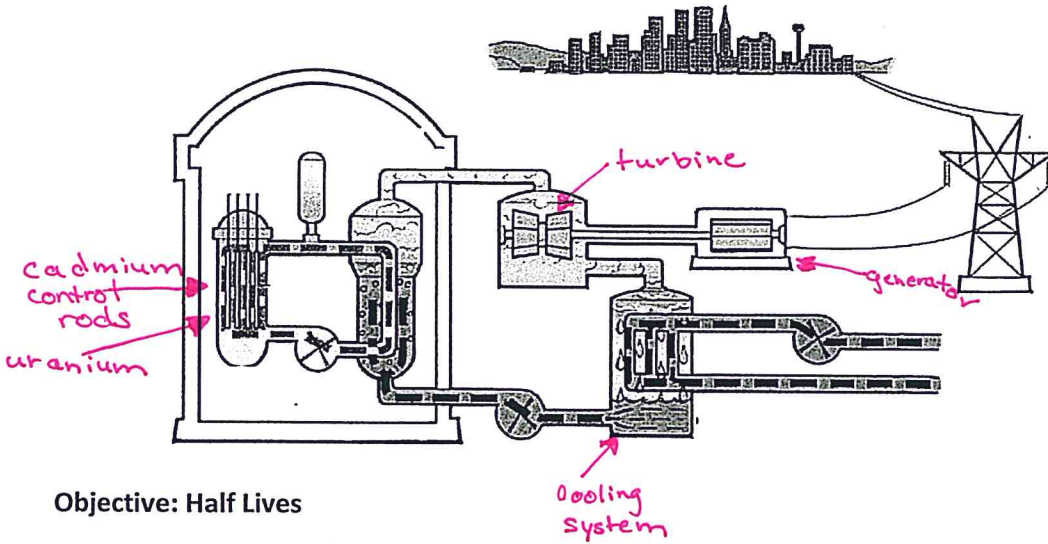


Objective: Nuclear Energy

1. What type of decay do nuclear power plants use?
fission
2. Describe the safety features nuclear power plants have to avoid meltdown.

Cadmium control rods, back up generators, cooling system, system override

3. Label the following parts in the picture below: Cadmium Control Rods, Uranium, Turbine, Generator, Cooling System



Objective: Half Lives

1. What is a half life?

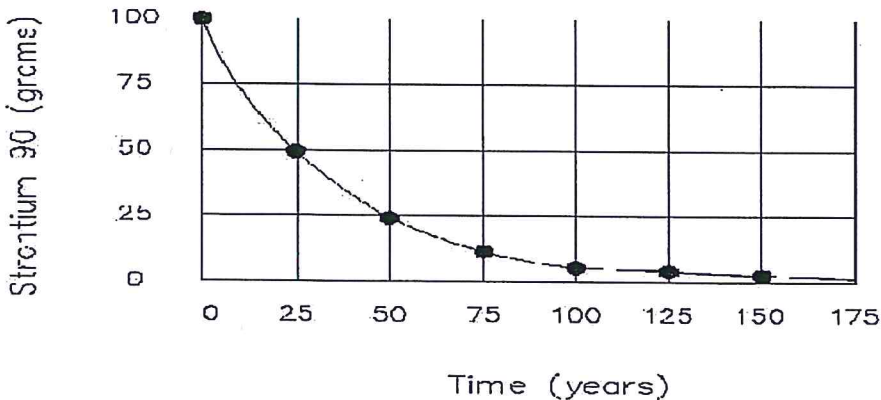
the amount of time it takes for half the amount radioactive material to decay into a stable form

Carbon-14 is a radioactive isotope found in tissue from once living organisms. The half life of C-14 is 5,730 years. Use this information to answer the following questions.

2. What is the age of a fossil that has 25% of carbon-14 left in it? $2HL \cdot 5730 = 11,460 \text{ years}$
3. How many half lives will pass by the time a 150g sample of carbon-14 decays into 4.69g? 5 half lives
4. How many years does it take for a 150g sample of carbon-14 to decay to 37.5g? $2HL \cdot 5730 = 11,460 \text{ years}$
5. What percentage of a sample of C-14 remains after 11,460 years? $2HL \dots 50 \frac{100}{2} \dots \frac{50}{2} = 25\%$
6. How much of a 200g sample of C-14 will remain after 4 half-lives (give your answer in grams)?

$$\frac{200}{2} \dots \frac{100}{2} \dots \frac{50}{2} \dots \frac{25}{2} \dots 12.5g$$

Use the graph about Strontium-90 below to answer the following questions.



7. What percent of Strontium-90 is left after 75 years? 12.5%
8. What is the half life of Strontium-90? 25 years
9. If you had 200g of Strontium-90, how much would be left after 25 years? $100g$
10. If you had 500g of Strontium-90, how much would be left after 4 half lives? $31.25g$
11. If you have 12.5% left of Strontium-90, how old is the sample? 75 years