Name:	Date:					
<b>Chemistry</b> ~ Ms. Hart	<u>Class:</u>	Anions	or	Cations	SCHOOL FOR CRIMINAL IUSTICE	
<u>10.6 Half</u>	5					

HALF LIFE: \_\_\_\_\_

**Example 1:** How much of a 100-mg sample of nitrogen-16 will remain after 28.8 seconds of decay? Use: GUESS

**Given = Step 1.** Write the given (include units!).

**Unknown = Step 2.** *What are we looking for (include units!)* 

**Equation = Step 3.** *What is the half-life of the isotope?* 

Half Lives Passed	Fraction Remaining	Amount Remaining	Time Passed
0	1		
1	1/2		
2	1/4		
3	1/8		
4	1/16		
5	1/32		

Substitute/Solve: Make a CHART and find your answer!

Example 2: Sodium-24 has a half-life of 15 hours. How much sodium-24 will remain in an 18.0g sample after 60 hours?

**Given = Step 1.** Write the given (include units!).

**Unknown = Step 2.** *What are we looking for (include units!)* 

Substitute/Solve: Make a CHART and find your answer!

Half Lives Passed	Fraction Remaining	Amount Remaining	Time Passed
0	1		
1	1/2		
2	1/4		
3	1/8		
4	1/16		

**Your Turn... Example 3:** Manganese-56 is a beta emitter with a half-life of 2.6 h. What is the mass of manganese-56 in a 1.0-mg sample of the isotope at the end of 10.4 h? **Given = Step 1.** 

Unknown = Step 2.

**Equation = Step 3.** What is the half-life of the isotope?

Half Lives Passed	Fraction Remaining	Amount Remaining	Time Passed

Substitute/Solve: Make a CHART and find your answer!

Complete these on your loose leaf:

**Problem #4:** Carbon- 14 emits beta radiation and decays with a half-life  $(t_{1/2})$  of 5730 years. Assume you start with a mass of 2.00 x 10<sup>-12</sup>g of Carbon-14. How long is three half-lives?

**Problem #5:** A patient is administered 20 mg of iodine-131. How much of this isotope will remain in the body after 40 days if the half-life for iodine-131 is 8 days?

**Problem #6:** The half-life of radium-226 is 1600 years. How many grams of a 0.25g sample will remain after 4800 years?