* Guided Notes

Compound Interest & Half-Life Name: Key Period: ___

OBJECTIVE: I can apply compound interest formulas and calculate growth and decay in real-world problems.

COMPOUND INTEREST: The the balance A in an account with principal P and annual interest rate r (in decimal form) is given by the following formula:

$$A = P\left(1+\frac{r}{n}\right)^{nt}$$

For n compounding per year after t years.

Example D: Find the account balance after 20 years if $100 is placed in an account that pays 1.2% interest compounded twice a month.

$$A = 100\left(1+\frac{.012}{24}\right)^{24(20)}$$

$$A = P\left(1+\frac{r}{n}\right)^{nt}$$

$$A = \$127.81$$

Example E: If $350,000 is invested at a rate of 5% per year, find the amount of the investment at the end of 10 years for the following compounding methods:

a) Quarterly $n=4$ $= \$575266.81$

b) Monthly $n=12$ $= \$576453.32$

$$A = 350{,}000\left(1+\frac{.05}{4}\right)^{40}$$

$$A = 350{,}000\left(1+\frac{.05}{12}\right)^{120}$$

Half Life: The time required for any specified property to decrease by half. (A measure of decay)

$$A = P(0.5)^t$$

A represents the final amount

P represents the original amount

T represents the number of half-lives in a given time period.

(To find t, divide the time period by the half life)

Example F: Fluorine-20 has a half life of 11 seconds. Find the amount of fluorine-20 left from a 40 gram sample after 44 seconds.