Name: __KEY__   Date: _____

General Form: $y = a(b)^x$ constant rate	Growth/Decay: $y = a(1 \pm r)^t$	Compound Interest: $y = P\left(1 + \dfrac{r}{n}\right)^{n \cdot t}$
a: y-intercept, starting point/initial amount b: <u>common ratio</u>, growth/decay x: time	a: y-intercept, starting point/initial amount r: rate (%) – convert to decimal t: time	P: initial amount r: rate (%) – convert to decimal n: # of times compounded per year t: time
Key Words: **No Percent** double: $b=2$ triple: $b=3$ quadruple: $b=4$ half: $b=\frac{1}{2}$	Key Words: **Percent (%)**	Key Words: **Compounded Annually**/Yearly – $1 = n$ Semi-Annually – $2 = n$ Quarterly – $4 = n$

Compound Interest

1. You deposit $1500 in an account that pays <u>5%</u> interest <u>compounded</u> yearly. Find the balance after 6 years.

P = 1500   n = yearly → 1 $y = 1500\left(1 + \dfrac{.05}{1}\right)^{1 \cdot 6}$
r = 5% → .05   t = 6 $\boxed{y = \$2{,}010.14}$

Growth/Decay

2. The mice population is 25,000 and is <u>decreasing</u> by <u>20%</u> each year. Write a model for this situation. What will be the mice population after 3 years?

a = 25000   t = 3 $y = 25000(1 - .2)^3$
r = 20% → .2 $\boxed{y = 12{,}800}$

General

3. The number of mosquitoes at the beach has <u>tripled</u> every year since 1999. In 1999, there were 2,500 mosquitoes. Write a model for this situation. How many mosquitoes would you predict were at the beach in 2005?

a = 2500   X = 2005 - 1999 = 6 $y = 2500(3)^6$
b = tripled → 3 $\boxed{y = 1{,}822{,}500}$

Compound Interest

4. Corey invested $1500 when he was a freshman in order to save for college. If he chooses to invest it in an account that earns <u>3.5%</u> interest and is <u>compounded</u> annually, how much money will he have after 4 years?

p = 1500   n = annually → 1 $y = 1500\left(1 + \dfrac{.035}{1}\right)^{1 \cdot 4}$
r = 3.5% → .035   t = 4 $\boxed{y = \$1721.28}$

Growth/Decay

5. I bought a car for $25,000, but its value is <u>depreciating at a rate of 10%</u> per year. How much will my car be worth after 8 years?

a = 25000   t = 8 $y = 25000(1 - .1)^8$
r = 10% → .1 $\boxed{y = \$10{,}761.68}$