10. The initial size of a bacteria population is 100 cells. The population of bacteria triples in size every 5 hours.

a. Model the bacteria population with an exponential function. Define your variables. $f(x)=$ bacteria population

$f(x) = 100 \cdot 3^{x}$ or $f(x) = 100 \cdot 3^{\frac{x}{5}}$

$x =$ every five hours $x =$ hours

b. Use your equation to find what the population of the bacteria is after 20 hours? Show work.

$f(x) = 100 \cdot 3^{4} = 100 \cdot 81 = 8100$

11. Suppose you deposit $1000 earned from your summer job in a savings account that pays 4.8% interest compounded annually.

a. Write an exponential function to model the amount of money in your savings account.

$y = 1000 \cdot (1.048)^{x}$

b. How much will you have in your account after 1 yr? After 2 yrs?

$y = 1000(1.048)^{1}$ & $y = 1000 \cdot (1.048)^{2}$

$1048 $1098.30

12. The tax revenue that a small city receives ~~increases~~ by 3.5% per year. In 1990, the city received $250,000 in tax revenue. Determine the tax revenue in each of the following years.

1995

$y = 250000 \cdot 1.035^{x}$

$y = 250000 \cdot 1.035^{5}$

$296921.58

2006

$y = 250000 \cdot 1.035^{16}$

$ 433496.51

13. A population of 100,000 birds decreases by 20% each year.

a. Write an exponential function to represent the current population. Define your variables.

$y = 100000 \cdot (.8)^{x}$

$x =$ years $y =$ # of birds

b. Use your equation to find the new population of birds after 3 years.

$y = 100000 \cdot (.8)^{3} = 51200$ birds

14. The population of Buffalo decreases by 1.2% each year. It currently (in 2013) has 330,000 people.

a. Write an exponential function that models this situation.

$y = 330{,}000 \cdot (.988)^{x}$

b. What do you predict Buffalo's population to be in 2018? What do you predict it's population to be in 2030?

$y = 330{,}000(.988)^{5} = 310669.53$

so about 310670 people