1) The population of the popular town of Smithville in 2003 was estimated to be 35,000 people with an annual rate of increase of about 2.4%.
   a.) Write an equation to model future growth.
   b.) Use your equation to estimate the population in 2007 to the nearest hundred people.

2) Marisa invests $300 at a bank that offers 5% interest compounded annually.
   a.) Write an equation to model the growth of the investment.
   b.) How many years will it take for the initial investment to double?

3) Matt bought a new car at a cost of $25,000. The car depreciates approximately 15% of its value each year.
   a.) Write an equation to model the decay value of this car.
   b.) What will the car be worth in 10 years?

4) A $1,000 deposit is made at a bank that pays 12% interest compounded annually. How much will you have in your account at the end of 10 years?

5) A bowl of cold tomato soup is warming to room temperature. The temperature difference between the soup and the room decreases by 10% every minute. What will the temperature difference be in 8 minutes if it is currently 21°C?

6) Find a bank account balance if the account starts with $100, has an annual rate of 4%, and the money left in the account for 12 years.

7) In 1985, there were 285 cell phone subscribers in the small town of Centerville. The number of subscribers increased by 75% per year after 1985. How many cell phone subscribers were in Centerville in 1994?
8) Bacteria can multiply at an alarming rate when each bacteria splits into two new cells, thus doubling. If we start with only one bacteria which can double every hour, how many bacteria will we have by the end of one day?

9) Each year the local country club sponsors a tennis tournament. Play starts with 128 participants. During each round, half of the players are eliminated. How many players remain after 5 rounds?

10) You have inherited land that was purchased for $30,000 in 1960. The value of the land increased by approximately 5% per year. What is the approximate value of the land in the year 2011?

11) During normal breathing, about 12% of the air in the lungs is replaced after one breath. Write an exponential decay model for the amount of the original air left in the lungs if the initial amount of air in the lungs is 500 mL. How much of the original air is present after 240 breaths?

12) An adult takes 400 mg of ibuprofen. Each hour, the amount of ibuprofen in the person’s system decreases by about 29%. How much ibuprofen is left after 6 hours?

13) You buy a new computer for $2100. The computer decreases by 50% annually. When will the computer have a value of $600?

14) The foundation of your house has about 1,200 termites. The termites grow at a rate of about 2.4% per day. How long until the number of termites doubles?