Context for Day 1 Modeling (Day 2)

1. Tyler drops a ball from various heights and records the time that it takes for the ball to hit the ground. The independent variable is time (seconds), the dependent variable is distance (meters).
   a) How does this model compare to the physical model $s = \frac{1}{2}gt^2$? What is Tyler's estimate of g? (It is known that the acceleration due to gravity is approximately 9.8 meters/sec^2.)
   b) Predict the height from which the ball was dropped if it took 8.9 seconds to reach the ground.

2. The table shows the number of live births per 1000 women aged 15-44 years in the United States, starting in 1980.
   a) Identify and interpret the slope of the line.
   b) Identify and interpret (if reasonable) the y-intercept.
   c) In 1978 the birthrate was actually 15.0. How close did your model come to this value?
   d) Predict the birthrate for 2015.
   e) Predict the birthrate for 2030.

3. The table gives the amount of insulin in the blood after a particular amount of time (minutes) has elapsed.
   a) What does the value of *a* in your model tell you?
   b) What does the value of *b* in your model tell you?
   c) When would you expect the insulin level to drop to 2.0?
   d) When would you expect the insulin level to drop to 0.0?

4. The table displays the results of the High-Low game. An individual picks a number from 1 to n and the other person guesses until they get the correct number. (After each guess the individual is told whether the guess is too high or too low.) "n" is the independent variable; the dependent variable is the number of guesses made until they were correct. How many guesses would one expect to make if the number was from 1 to 1,000,000?