**Post-Break Review Questions**

1. What does *statistically significant* mean?

   The result is not likely to be due to chance.

2. What is the difference between a *population* and a *sample*?

   A population is the entire group of interest. A sample is a subset of the population small enough to be studied.

3. What is the difference between a *parameter* and a *statistic*?

   A parameter is a variable defined for a population. A statistic is a variable defined for a sample.

   We often use a statistic value as an estimate for a parameter value. For example, we might estimate the mean weight of all adults in the U.S. by determing the mean weight for a sample of 1000 adults in the U.S. The statistical inference methods we will soon study give us ways to describe the quality of a statistical estimate.

4. Here's a random phenomenon and a random variable:

   - Start with a population having many items/individuals with a proportion $p$ of these being "successes".
   - Draw a simple random sample of size $n$.
   - Count the number $X$ of items/individuals in this sample that are "successes".
   - Compute the sample proportion $\hat{p} = \dfrac{X}{n}$.

   (a) What is the mean for $\hat{p}$? $\mu_{\hat{p}} = p$

   (b) What is the standard deviation for $\hat{p}$? $\sigma_{\hat{p}} = \sqrt{\frac{p(1-p)}{n}}$

   (c) What does the result for (a) tell us about using a specific value of $\hat{p}$ as an estimate for $p$?

   The sample proportion is an unbiased estimate of the population proportion.

   (d) What does the result for (b) tell us about using a specific value of $\hat{p}$ as an estimate for $p$?

   We can reduce the variability in the distribution for $\hat{p}$ by increasing the sample size.