

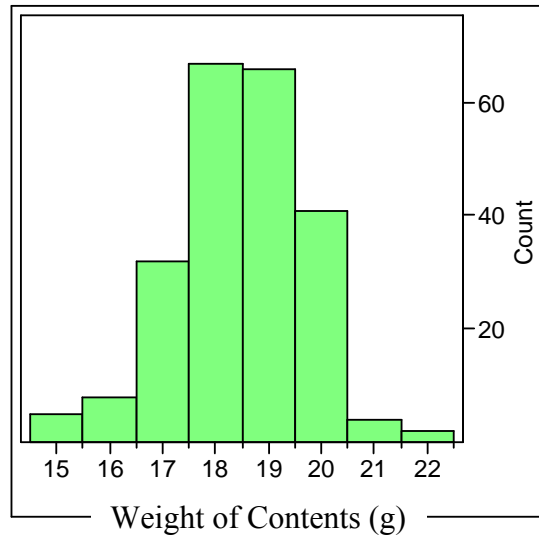
**Stat 104 – Homework 6**  
**Due Thursday October 29, 2009**

**Reading:**      October 13 – October 22                      Chapter 6  
                         October 27 – November 3                      Chapter 7

**Assignment:**

1. Complete the following problems from the text: 6.3, 6.4, 6.7, 6.8, 6.23, 6.24, 6.27, 6.28, 6.43, and 6.44.
  
2. For ewes (female sheep), pregnancy results in one lamb 60% of the time and in multiple lambs 40% of the time. Different ewes are independent in terms of whether they will have single or multiple lambs. Suppose that there are 16 ewes about to give birth.
  - a) Use JMP to calculate the probability distribution for the number of births that result in single lambs. Round probabilities to 4 decimal places.
  - b) Have JMP create a histogram of the probability distribution. Be sure the histogram has a probability axis.
  - c) Describe the shape of the probability distribution.
  - d) What is the probability that there are exactly 10 births resulting in single lambs?
  - e) What is the probability that more than 10 births result in single lambs?
  - f) What is the probability that 5 or fewer births result in single lambs?
  - g) What is the probability that 5 or fewer births result in multiple lambs?
  - h) What is the mean number of births resulting in single lambs, round to 1 decimal place? Explain how the mean number can be a fraction, even though number of births is a whole number.
  - i) What is the standard deviation of births resulting in single lambs, round to 2 decimal places?
  - j) What is the probability that the number of births resulting in single lambs falls between the mean minus two standard deviations and the mean plus two standard deviations?
  - k) Turn in the JMP data table that contains the binomial probabilities as well as the JMP output summarizing the distribution.

3. In the first lab data on the weights of unopened Fun Size bags of M&Ms were collected. Last year, data on the weight of contents, just the M&Ms with no bag, were collected. Below is a histogram of weights of contents of Fun Size bags.



- a) Describe the shape of the histogram. Why is it reasonable to use a normal model for the distribution of the weight of contents for all Fun Size bags of M&M's?
- b) Use a normal model with  $\mu = 18.5$  g, and  $\sigma = 1.25$  g for the distribution of weight of contents for Fun Size bags of M&M's.
- What is the probability that a Fun Size bag will have a net weight less than 16 g?
  - What is the probability that a Fun Size bag will have a weight of contents greater than 22 g?
  - What is the probability that a Fun Size bag will have a weight of contents between 17 g and 20 g?
  - We wish to label the Fun Size bag such that 97% of all Fun Size bags will contain at least the labeled weight. What should the label weight be?