## **Unit 3:** Distributions for Quantitative Data and Measures of Center (Modules 7 & 8)

1. Use the case-value graph below to answer each of the following questions.



1. How many hatchbacks get 23 mpg in the city?
2. What are the mpg rates that occur most frequently?
3. Which mpg rate is the middle rate?
4. In question #1, were you asked to examine the individuals cases and their values? Or were you asked to describe patterns in data and/or to create summaries about the group?
5. Was it awkward to work with the case-value graph in #1? Why or why not?
6. Let's answer the same questions using a dotplot to represent the same data for the variable MPGCity.



1. How many hatchbacks get 23 mpg in the city?
2. What are the mpg rates that occur most frequently?
3. Which mpg rate is the middle rate? What did you do to find this "middle"?
4. Which graph gives a more immediate summary of the distribution for the MPGCity variable (the case-value graph on the first page of this activity or the dotplot on the second page)? Explain.
5. Use the dotplot to summarize the data even further.
6. What is the overall range for the mpg values?
7. What is a typical range (the main clump of data) for the mpg values?
8. What is the average mpg?
9. What are the outlier mpg rates?
10. For each of the following dotplots, draw a smooth curve outlining the distribution, and then describe the shape of the distribution.







1. The following is a histogram indicating the distribution of scores on the Spring 2012 Module 1 Checkpoint for an instructor’s combined classes.



What percentage of students scored below 80% (assume left-hand endpoints are included in each bin)?

1. For each of the following questions, give an exact answer if possible. If the histogram in #8 doesn’t provide enough information to answer exactly, give a range of possible answers.
2. What percentage of the students who took the exam scored at least 88 but less than 96 points?
3. What is the lowest grade on the Module 1 Checkpoint?
4. What percentage of students scored less than 90?
5. How many students did not pass the exam, if "not passing" is a score of 70 or less?
6. Describe the shape of the distribution of the Module 1 Checkpoint Scores in the histogram in #8 (try to write your response like a statistician).
7. Describe where the center appears to be in this distribution (again … try to write like a statistician).
8. Describe the range for this data (you should come up with a single number).
9. Describe any apparent outliers.
10. Here are data from adults (247 men and 260 women) who were exercising several hours a week. Indicate whether you think the following statements are **valid** or **invalid** (and try to explain why using evidence from the histograms).



1. Typical females have a smaller waist girth than typical males.
2. The overall range in waist girth is smaller for females than for males.
3. A medium size pair of pants will fit a woman with a waist girth between 72 and 76 centimeters, so a medium size pair of pants with fit about 20% of the women in this sample.