Learning Goal: For the distribution of a quantitative variable, describe the overall pattern (shape, center, and spread) and striking deviations from the pattern.

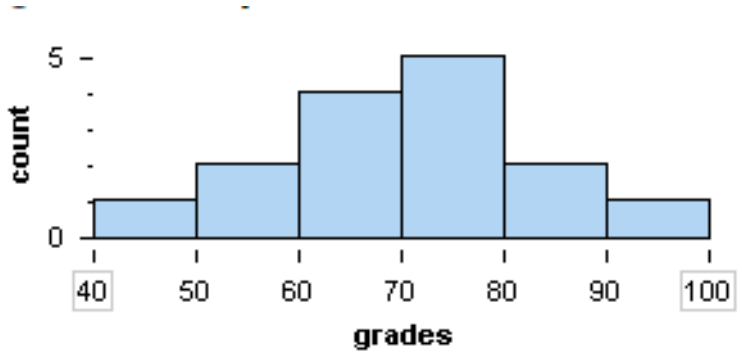
Specific Learning Objective:

- Distinguish between categorical and quantitative variables;
- Identify graphs that represent the distribution of a quantitative variable;
- Analyze the distribution of a quantitative variable using a histogram. Describe shape, give a general estimate of center and the overall range, and calculate relevant percentages.

Overview:

In this activity you will again practice analyzing the distributions of quantitative variables using descriptions of shape, center and spread. This is the same type of thinking you did previously with dot plots, but this time the data will be summarized in a histogram.

This histogram shows the distribution of exam scores for 15 students in a Biology class.



a) How would you describe the shape of this distribution of exam scores? (Use course vocabulary.)

b) Give an interval that describes typical grades on this exam.

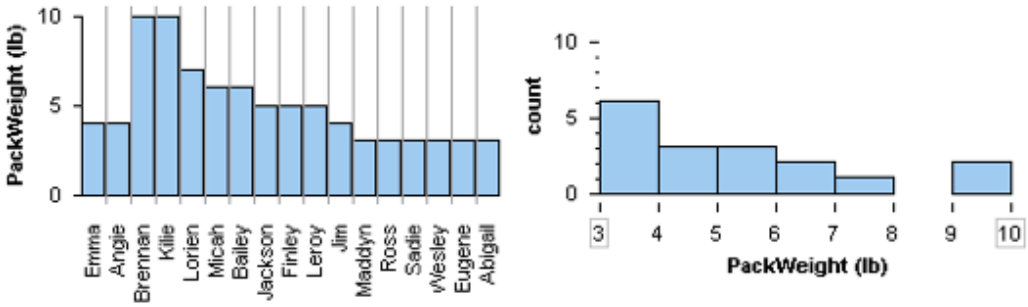
c) The *range* is the largest value minus the smallest value (Range = Max – Min). What is the largest the range could be? What is the smallest the range could be?

d) What percentage of the students made a D on the exam (a grade of 60-69%)?

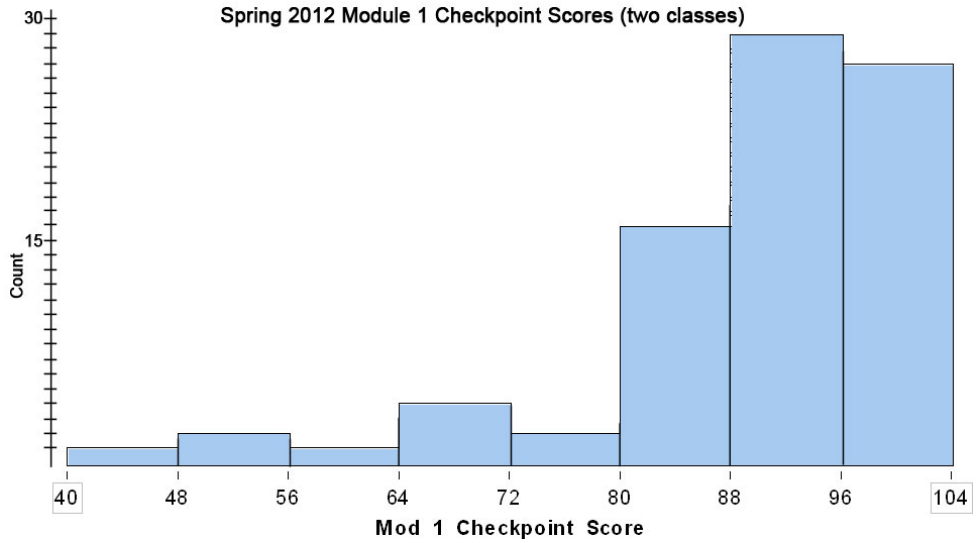
e) What percentage of the students passed the exam with a 70 or better?

Group Work.

1) Which of the graphs below is a histogram? How do you know?



2) The following is a histogram indicating the distribution of scores on the Spring 2012 Module 1 Checkpoint for 82 students in Math 27 classes.



a) How would you describe the shape of this distribution of quiz scores? (Use course vocabulary.)

b) Give an interval that describes typical performance on this quiz.

For each of the following questions, answer the question if the histogram provides enough information to answer it. If not, write "not enough information".

c) What percentage of students scored below 80%?

d) How many students made an A (scored a 90% or higher)?

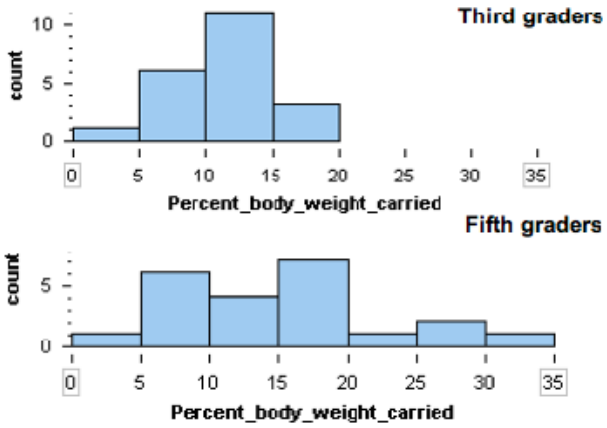
e) What is the lowest grade on the Module 1 Checkpoint?

f) What percentage of the students aced the quiz (a score of 100%)?

g) What is the average (mean) quiz score?

h) Did the majority of students pass the quiz (70% or better)?

3) The data graphed in these histograms describes 43 elementary school children. The variable is "percent of body weight carried in the school backpack." A child who weighs 60 pounds and carries 9 pounds has a variable value of 15% since 9÷60=0.15=15%. The American Chiropractic Association (ACA) recommends that children carry no more than 10% of their body weight.



% of body weight carried in backpack	Third graders	Fifth graders
0-5%	1	1
5-10%	6	6
10-15%	11	4
15-20%	3	7
20-25%	0	1
25-30%	0	2
30-35%	0	1
Total	21	22

a) Of the 3rd graders, how many are following the ACA recommendation?

b) Of the 3rd graders what percentage is following the ACA recommendation?

c) Of the 5th graders, what percentage is following the ACA recommendation?

d) Of all the children in this study, what percentage is NOT following the ACA recommendation?

e) Of the 5th graders who are NOT following the ACA recommendation, what percentage are carrying more than 25% of their body weight?