

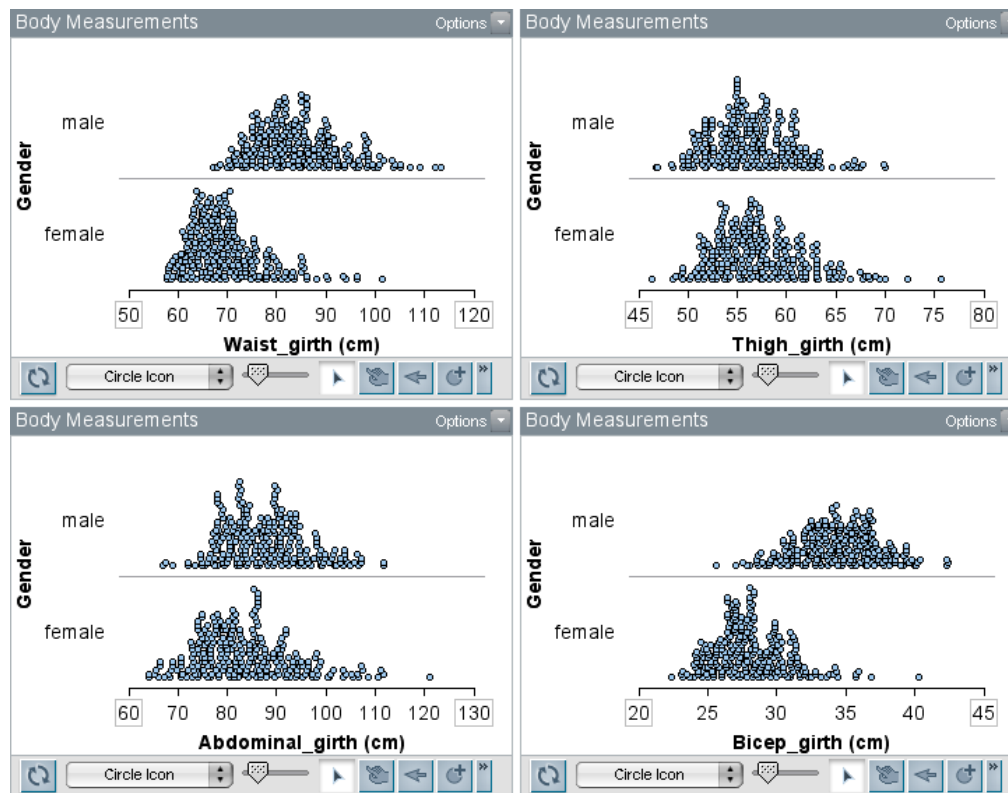
Name: _____

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 Objectives:

- Use the mean and standard deviation to create intervals of typical measurements.
- Use technology to generate graphs and numerical summaries to compare distributions of a quantitative variable.
- Compare and contrast different ways of identifying intervals of “typical” data values.

1) Here are the distributions for data we have on waist girth, thigh girth, abdominal girth and bicep girth measurements for 247 men and 260 women who exercise regularly.



a) For which of the four variables would you argue that that men tend to be larger than women? Why?

b) For which of the four variables would you argue that that men tend to be about the same size as women? Why?

- c) Here are the means and SDs for each variable in centimeters. For three of the four variables males have a larger mean. **But using a single number (the mean) to represent the distribution does not take into account the variability in the data.** So we will calculate intervals of typical measurements for men and for women (mean \pm SD) and look at the overlap (or lack of overlap) to compare the distributions.

	Waist girth		Thigh girth		Abdominal girth		Bicep girth	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Males	84.5	8.8	56.5	4.3	87.7	8.4	34.4	3.0
Females	69.8	7.6	57.2	4.6	83.7	9.9	28.1	2.7

Typical **waist** girth males:

Typical **waist** girth females:

Substantial overlap in typical waist measurements? (Circle one: yes, no)

Typical **thigh** girth males:

Typical **thigh** girth females:

Substantial overlap in typical thigh measurements? (Circle one: yes, no)

Typical **abdominal** girth males:

Typical **abdominal** girth females:

Substantial overlap in typical abdominal measurements? (Circle: yes, no)

Typical **bicep** girth males:

Typical **bicep** girth females:

Substantial overlap in typical bicep measurements? (Circle: yes, no)

- d) Do the intervals you calculated in c) support your answers to a) and b)? Explain.

- 2) Suppose that you are designing a one-size-fits-most unisex belt for adults. A one-size-fits-most belt cannot fit everyone, but we want it to fit “typical” adults. We will use technology to identify “typical” intervals of waist measurements for the 507 adults in the data set *Body Measurement.txt* using ideas from Unit 2.
- a) For the waist girth, find an interval of typical measurements using quartiles.
 - b) Find an interval of typical measurements using mean and standard deviation.
 - c) Which interval do you think is the best to use in this situation to identify typical measurements? Why?

3) Open the *Body Temp and Heart Rate* data set.

d) What heart rate do you think best represents the men in this sample? What about the women? Did you choose a mean or a median or some other number? Why?

e) Which gender has more variability in their heart rates? Support your answer.

f) Give an interval of “normal” heart rates for each gender using either quartiles or mean and SD. Briefly explain why you chose the measures you used.

g) Based on this data, what do you think nurses should use as an interval of typical heart rates for adults? Should they use different intervals for men and women? Why or why not?