

# Lesson 8

## Variations, Variations, and More Variations

Activity 8.1: What do I do with all this data?

Activity 8.2: How can we show ranges of variation?

Activity 8.3: Variation everywhere, so what?

Activity 8.4: How do genes work for continuous traits?

Reading 8.4: Height—Unraveling a genetic puzzle

# Representations—Data Table

Subject	Height

# Representations—Bar Graph

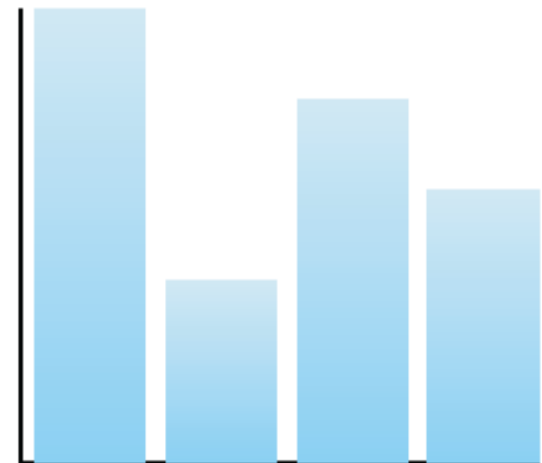
## BAR GRAPH

- Data is organized into amount intervals of data shown by bars.
- The bars are of equal widths and equal distances apart
- Usually the Y-axis shows the number of what is being measured.  
All of the data must fit on the axis
- The X-axis is the **discrete** data such as names, objects, or colors.
- There is one bar per discrete data.

**Example**—My class's favorite sport

Y-axis = Number of students

X-axis = Sport (baseball, swimming, and so on)



*Do not forget to label the X and Y axes.*

# Representations—Pie Chart

## PIE CHART WITH 2 VALUES

- Data is organized as percentages of the whole.
- Add the total number of what's being represented. Calculate the percent in each category. Find the angle by converting one of the percents to a decimal (move the decimal point two places to the left).
- Multiply the decimal by  $360^\circ$
- Draw a circle with a compass. Draw the radius from the center of the circle to the edge.
- Use a protractor and draw the angle.

**Example**—The percent of people in my class who play baseball

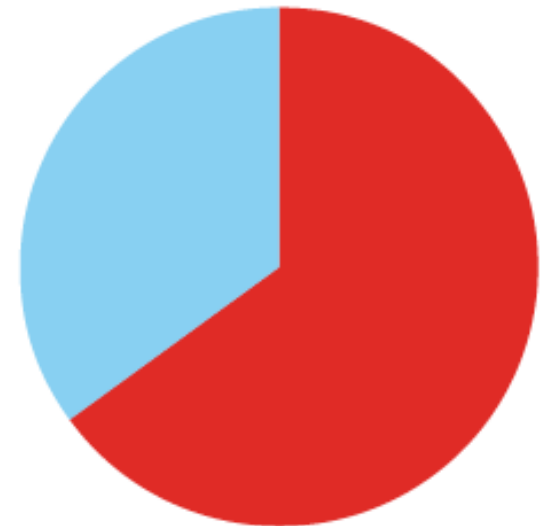
*Count the number of people in the class.*

*Count how many of them play baseball.*

*Baseball players/class*

$$12/30 = .40 = 40\% \quad 18/30 = .60 = 60\%$$

$$.40 \times 360 = 144^\circ$$



*Do not forget to label sections.*

# Representations—Line Graph

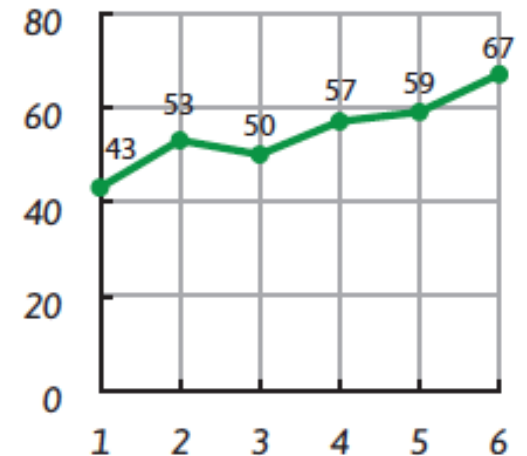
## LINE GRAPH

- Line graphs can show how something changes over time.
- Two values can be plotted on the axes.
- The Y-axis usually has the numbers or what is being measured.
- The X-axis usually has continuous data of time.

**Example**—Temperature for a 12-hour period

Y-axis = Temperature (continuous)

X-axis = Day of the week (continuous hours)



Do not forget to label the X and Y axes.

# Representations—Histogram

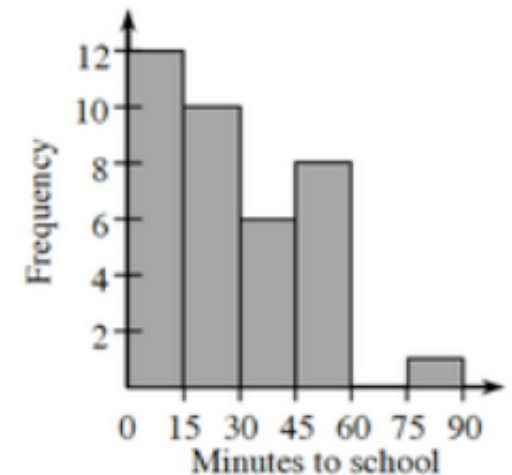
## HISTOGRAM

- Histograms display numeric data with an order into intervals called “bins”
- The X-axis show the intervals for the data. The labels represent the **lower end** of each interval
- The Y-axis has the frequency (number of pieces of data in each interval)

**Example**—Number of minutes it takes students in my class to get to school.

Y-axis = frequency (number of students)

X-axis = Minutes to school (each bin is 15 minutes)



*Do not forget to label the X and Y axes*

# Monarch Butterfly Larva-Variations?



# Snails—Variation?





# Guppies—Variation?



# Orchids—Variations?

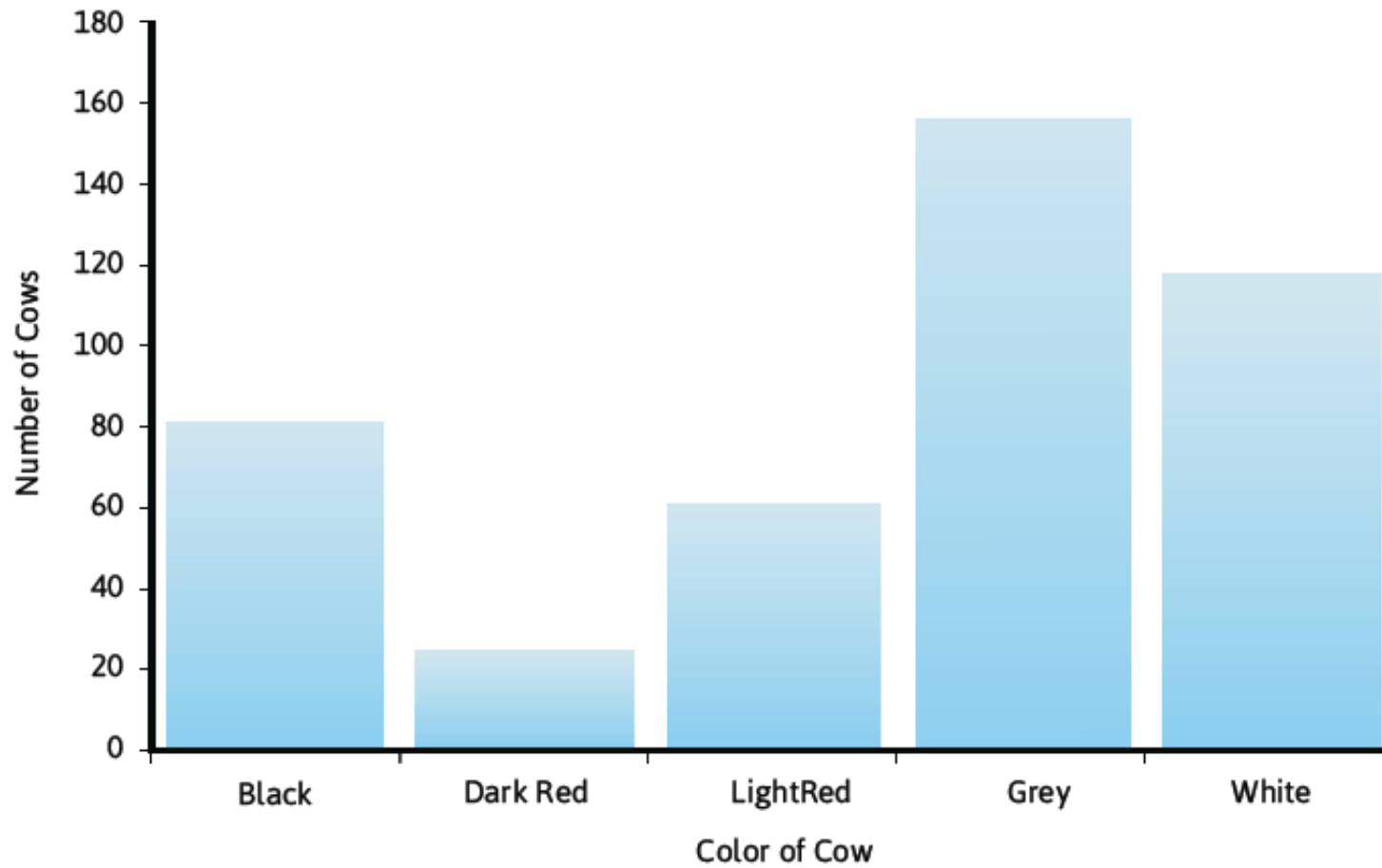


# Activity 8.3 Part 2--Page 94

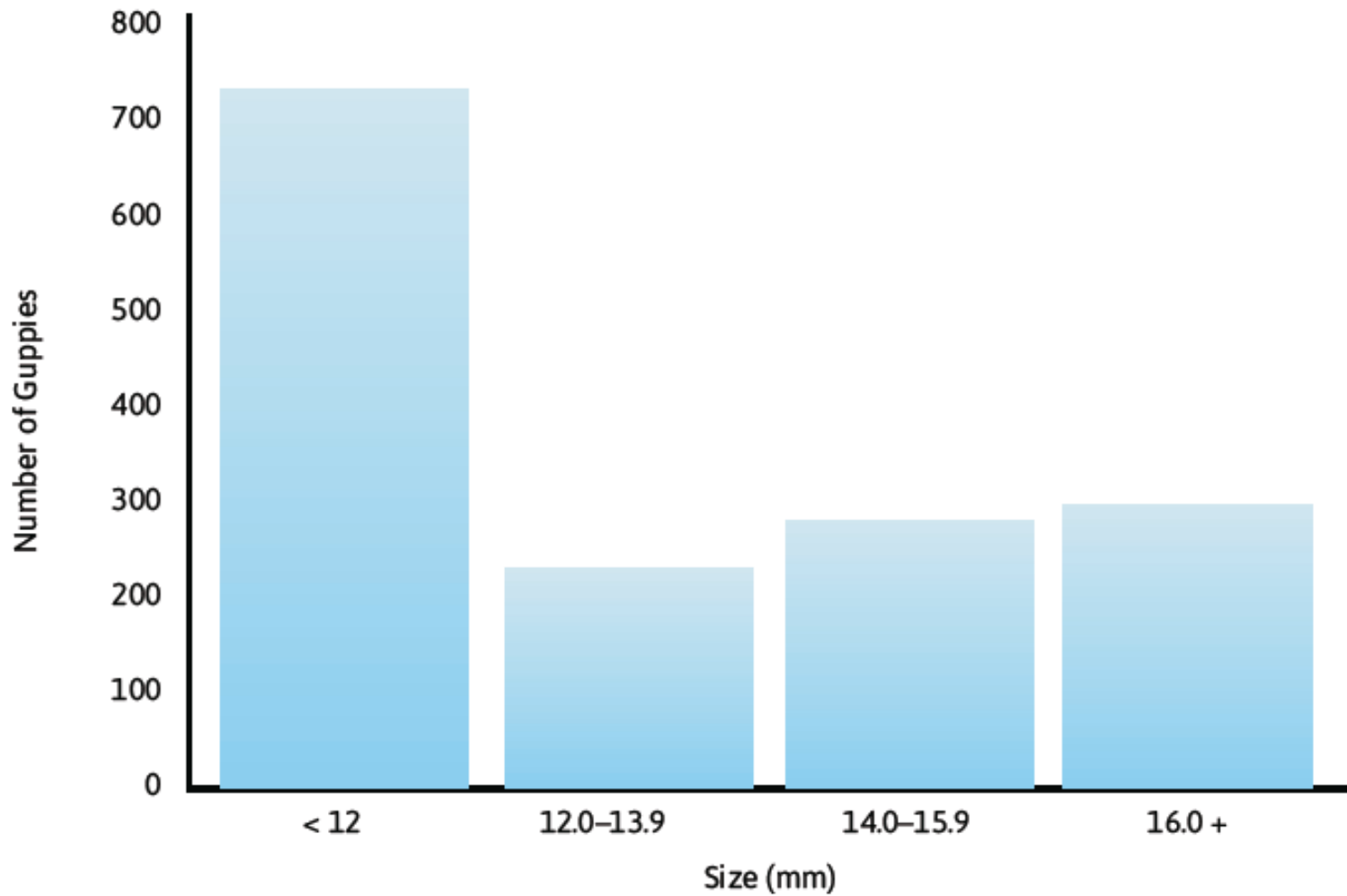


Charlolais cows are on the left. On the right is a Holstein cow.

# Color of Cow



# Guppy Size



# Blood Type

