Monday, May 18, 2020: Analyzing Trait Data from Histograms

Objectives:

1. We will examine two different populations of organisms and analyze data about those populations.

2. As you read and examine the data, you will consider why a certain graphic representation was used to display the data.

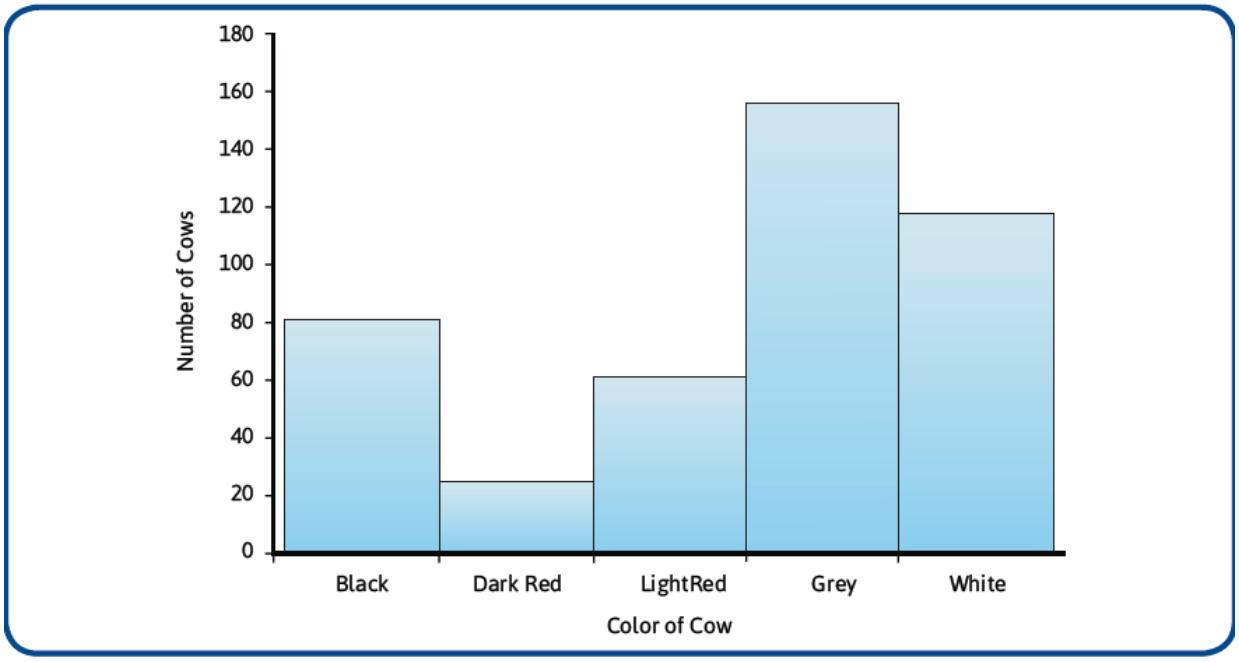
Charolais cows are on the left. On the right is a Holstein cow.

Case 1—That's a cow of a different color

It may not be surprising to you that cows, just like dogs, can be found in different breeds. People tend to use different breeds of cows to produce different food products. For example, Holstein cows are raised for their milk, and beef cows in England are known as Charolais cows. Each of these cows looks fairly similar but demonstrates variations in their traits. Holstein cows tend to be white with black spots and Charolais cows can vary in color from white to cream. Some scientists were interested in understanding the relationship between a cow's genes and the color of its coat. In order to understand this relationship, the scientists examined cows that resulted from breeding Charolais (white to cream) and Holstein (white and black) cows together. They tracked the colors of a population of 436 cows. They classified the cows into five different colors. They then determined how many cows were each color. The information they gathered is shown in the following table.

Data Table: Number of offspring of different colors when Holstein (black and white) cows and Charolais (white to cream) cows are bred with one another

Color	Number of Cows (population of 436)	Percent of Cows (population of 436)
black	80	18.4
dark red	24	5.5
light red	60	13.8
grey	155	35.6
white	117	26.9



Making Sense

Answer the following questions based on the data gathered on cows.

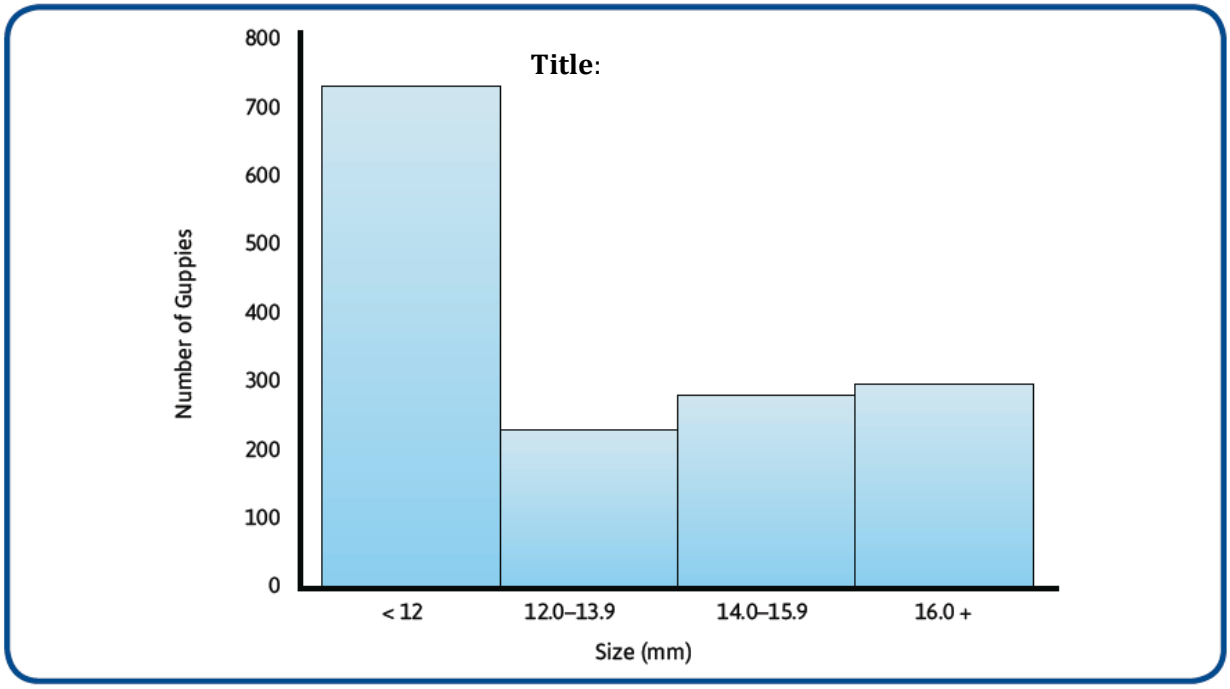
1. a. What type of graph is used (above) to display the data?_____

   b. Why is this a good type of graph to represent these data? (be specific)

2. Make a specific claim about what the histogram shows about the number of offspring of different colors when Holstein cows and Charolais cows are bred with one another?

Case 2 – Guppy Size

A group of scientists were interested in environmental factors (such as number of predators, water quality, and water temperature) that affected the length of guppies in local ponds. In order to understand these factors, the scientists first looked at the sizes of the guppies (in mm) found in 14 different ponds. The data for the total number of guppies of each size is found in the following graph.



Making Sense

Answer the following questions using the graph about guppy size.

1. a. What type of graph is used to represent the guppy data? _____

   b. Why is this a useful type of graph to represent the data? (Be specific)

   c. Add a title to the graph where indicated (use a text box)

2. Make a specific claim to answer the question: How does the size of guppy vary in the 14 ponds?

3. You have now analyzed variations for people (albinism, sickle cell anemia), guppies (length), flowers (patterns), snails (stripes), and cows (color).

Pick one example of a trait that you have analyzed.

Explain below (using a text box) why an organism with one variation of a trait would have an advantage for survival over an organism that had a different variation of the trait.