

KEY CONCEPT OVERVIEW

In this topic, students develop a statistical project. They use the four-step method: write a statistical question, collect appropriate data, construct appropriate graphical and numerical summaries, and write an answer to the statistical question. Students revisit the graphs (dot plots, histograms, and box plots) and numerical summaries (mean, mean absolute deviation [MAD], median, and interquartile range) that they have worked with throughout the module. They choose the best representations to integrate in their projects, answering real-world questions and furthering their understanding of shape, center, and variability in a data set.

You can expect to see homework that asks your child to do the following:

- Develop or choose a statistical question from previous lessons. Create and explain a plan for collecting and summarizing data. Complete the statistical project.
- Match a histogram to the appropriate set of summary measures (minimum, lower quartile, median, upper quartile, maximum, mean, and MAD).
- Given a dot plot, determine the five-number summary and then create a histogram.
- Match the data presented in a histogram to the dot plot that represents the data.
- Answer questions by analyzing the data shown in a dot plot, box plot, and/or histogram.

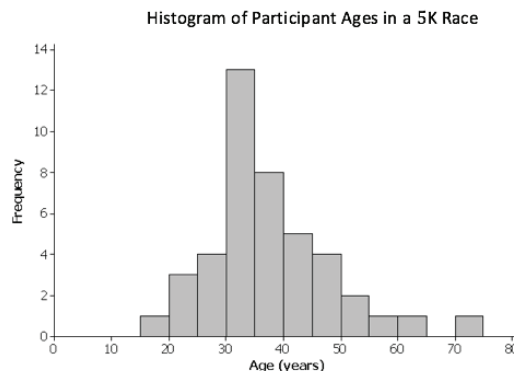
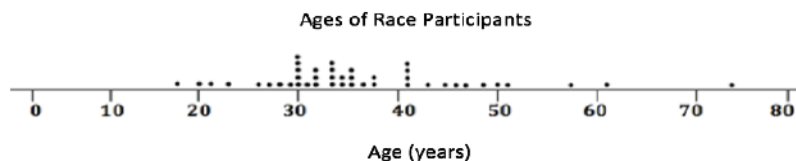
SAMPLE PROBLEMS *(Lesson 18)*

Here is a data set of the ages (in years) of 43 participants who ran in a 5-kilometer race.

20	30	30	35	36	34	38	46
45	18	43	23	47	27	21	30
32	32	31	32	36	74	41	41
51	61	50	34	34	34	35	28
57	26	29	49	41	36	37	41
38	30	30					

Here are summary statistics, a dot plot, and a histogram for the data:

Minimum = 18, Q1 = 30, Median = 35, Q3 = 41, Maximum = 74, Mean = 36.8, MAD = 8.1



SAMPLE PROBLEMS *(continued)*

a. For the dot plot and histogram, would you describe the shape of the data distribution as approximately symmetric or as skewed?

Both graphs show a slightly skewed right data distribution.

b. What is something you can see in the dot plot that is not as easy to see in the histogram?

In the histogram, we cannot see exact values because the data are grouped in intervals, so we cannot determine the exact minimum or maximum age or the median age. Because the dot plot provides a dot for each observation, we can see the exact data values. We know the minimum is 18, the median is 35 (the middle value, or the 22nd observation, of the 43 observations), and the maximum is 74.

c. Do the dot plot and the histogram seem to be centered in about the same place?

Yes. Since both graphs are based on the same data, they should generally communicate the same information regarding the center.

d. Do both the dot plot and the histogram convey information about the variability in the age distribution?

Yes. Both graphs are based on the same data, so they generally communicate the same information about variability. However, in the dot plot, it is easy to see that the oldest runner (74) is an extreme departure from the other data. This is not as apparent in the histogram.

Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

HOW YOU CAN HELP AT HOME

You can help at home in many ways. Here are some tips to help you get started.

- This module culminates in a four-step statistical project. Step one: Have your child explain the statistical question she wrote. Step two: How does she plan to collect the appropriate data? Step three: What graph (dot plot, histogram, or box plot) would work best to represent the data? What measures of center (mean or median) and variability (MAD or interquartile range) best represent the data? Step four: Have your child answer her statistical question.
- Your child will be required to present his completed statistical project. Throughout this topic, refer back to your child's project to monitor his progress. Encourage him to describe his work and, if applicable, to rehearse his presentation so he's more comfortable and confident when he presents the project.