InsightMath California

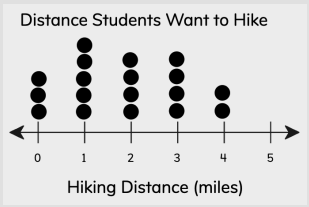
# Exploring Statistics

Family Guide | Grade 6 | Unit 9

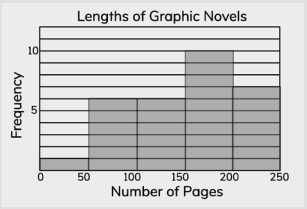
**Your student is exploring how how data is represented and analyzed can impact how it is interpreted.**

## Key Math Ideas

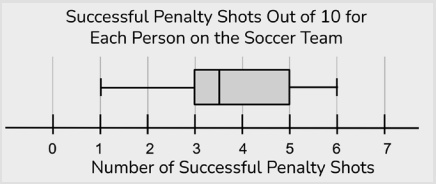
In previous grades, students explored data by creating and interpreting bar graphs and line plots. In this unit, students will use dot plots (formerly called line plots), histograms, and box plots to represent data. Students will analyze and interpret data by describing the shape of the data (for example, skewed, symmetric, uniform, or with several peaks), and use measures of center and spread to describe the shape of the data numerically. A measure of center, such as the mean, median, or mode, describes a typical value in the data set. A measure of spread, such as the range or interquartile range, describes how much typical data points vary from the measure of center. Across this unit, students explore real-world data and end by conducting their own data investigation.




Dot Plot



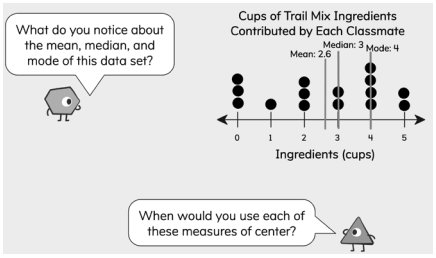

Histogram




Box Plot

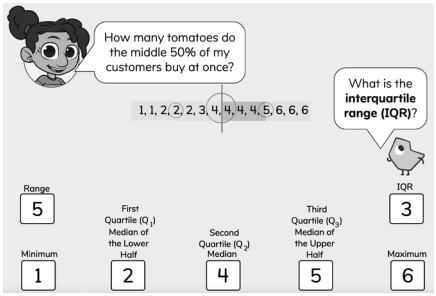
**→ In the first half of the unit, your student will learn to**

- create dot plots and histograms from data sets and tables;
- use the shape of the data displays, such as skew, symmetry, peaks,clusters, or gaps, to describe, compare, and interpret data sets;
- explain how dot plots provide more details, but histograms may be more useful for showing overall trends;
- find measures the mean, median, and mode of a data set or dot plot and use them to interpret data in context and support a claim;
- explain that measures of center indicate what a "typical" value is in a data set and that the shape of the graph determines whether it is more useful to use the mean, median, or mode;
- find how far individual points deviate from the mean in the positive or negative direction.




**→ In the second half of the unit, your student will learn to**

- explain that measures of spread show how much typical values deviate from the median or mean;
- find the interquartile range (IQR), which identifies the range of the middle 50% of the data points;
- find the mean absolute deviation (MAD) of a data set, which showsthe average distance between each data point and the mean;
- create box plots for a data set and explain what they tell about each 25% of the data points;
- describe the difference between statistical questions that expect variation in responses (How tall are students in our class?) and non-statistical questions (How tall are you?);
- conduct a data investigation and choose appropriate data displays and measures of center and spread for presenting the results based on the shape of the data




## Helpful Hint

Students may overly rely on the mean as the most important measure of center rather than considering whether the median might be a better representation of the data. If your student seems to always choose the mean as the "most typical" single number to describe a data set, remind them to also consider the median and mode, especially when the data is not symmetrical or has outliers.

# Tips for Supporting Your Student at Home

## Questions to Ask Your Student

### → In the first half of the unit:

- What is the same about dot plots and histograms? What is different?
- What does the shape of a data set tell you?
- What do the measures of center (mean, median, and mode) tell you about a data set?
- What is the difference between the mean and median?

### → In the second half of the unit:

- How can you use numbers to talk about the spread or distribution of a data set?
- How can you use the five-number summary to display and understand each 25% of the data points in a set?
- What is the difference between a statistical and non-statistical question?
- What do you think about when you're deciding how to represent data to make it easy for people to understand?

| If... | Try... |
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| your student incorrectly identifies a distribution with a tail on the left and a peak on the right as "skewed right" because most of the points are on the right . . . | looking at skewed graphs and discussing that skew means that something is off-center or atypical, like the data points in the tail of a graph. Thus, a graph with a big cluster on the right and a tail on the left is skewed to the left. |

## Student Strengths Spotlight

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| **I seek out challenges as opportunities to grow.** | Perseverance is important for young mathematicians, allowing students to build skills and confidence. |
| **I explain how my classmates' reasoning compares to my own.** | Students learn by noticing how classmates make different choices for interpreting or representing data. |
| **I am precise with the words I use to explain thinking.** | Students use vocabulary associated with new math content to explain how they can analyze and interpret data using mean, median, mean absolute value, and more. |
| **I use math to represent real-life situations, and I create contexts to match the given math.** | Students create data displays and analyze real-world data represented in dot plots, histograms, and box plots. |

## Try This Together!

- **Conduct a Data Investigation.** Have your student follow the steps below to conduct their own data investigation:
  1. **Ask a Question**
  2. **Collect the Data**
  3. **Represent the Data**
  4. **Analyze the Data**
  5. **Interpret the Data**
- Have your student decide on a statistical question they would like to have answered to collect data such as, "What is the average heart rate of the people in our family?" Support your student to collect the data and create a data display to represent it. Analyze the data with your student to figure out what the data helped them to learn.
- **Data Scavenger Hunt.** Find different ways that data is represented in the real world outside of school, specifically looking for dot plots, histograms, and box plots. (Newspaper articles and online infographics are a great source!) Ask your child to share what they learn from the graph and why the person might have chosen that type of data display. When possible, have your student describe the shape of the data (skewed, symmetric, etc.) and find measures of center (such as mean and median) and measures of spread (such as the interquartile range).