Big Ideas Math: Green

Parent Newsletter

BIG IDEAS LEARNING®

Standards

Common Core:

6.SP.2: Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.

6.SP.4: Display numerical data in plots on a number line, including dot plots, histograms, and box plots.

6.SP.5c: Summarize numerical data sets in relation to their context by giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.

6.SP.5d: Summarize numerical data sets in relation to their context by relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.

Essential Questions

How can you use place values to represent data graphically?

How can you use intervals, tables, and graphs to organize data?

How can you describe the shape of the distribution of a data set?

How can you use quartiles to represent data graphically?

Students will...

Make and interpret stem-and-leaf plots.

Make histograms.

Use histograms to analyze data.

Describe shapes of distributions.

Choose appropriate measures of center and variation to represent data sets.

Make and interpret box-and-whisker plots.

Compare box-and-whisker plots.

Key Ideas

Stem	Leaf
2	0 0 1 2 5 7
3	1 4 8
4	2
5	8 9

Key: $2 \mid 0 = 20$

The *key* explains what the stems and leaves represent.

Stem-and-Leaf Plots

- A **stem-and-leaf plot** uses the digits of data values to organize a data set.
- Each data value is broken into a **stem** (digit or digits on the left) and a **leaf** (digit or digits on the right).
- A stem-and-leaf plot shows how data are distributed.

Box-and-Whisker Plot

- A **box-and-whisker plot** represents a data set along a number line by using the least value, the greatest value, and the quartiles of the data.
- A box-and-whisker plot shows the *variability* of a data set.
- The five numbers that make up the box-and-whisker plot are called the **five-number summary** of the data set.
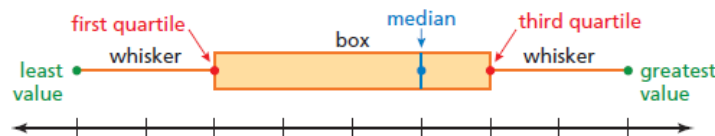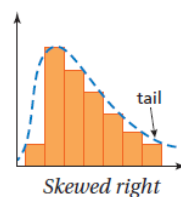

Symmetric and Skewed Distributions

Skewed left   *Symmetric*   *Skewed right*
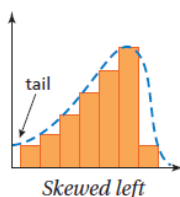
- The "tail" of the graph extends to the left.
- Most data are on the right.
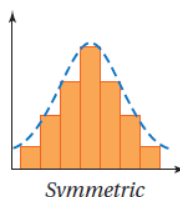
- The left side of the graph is a mirror image of the right side of the graph.

- The "tail" of the graph extends to the right.
- Most data are on the left.

Key Terms

A *frequency table* is a table used to group data values into intervals.

The number of data values in an interval is called the *frequency*.

Good to know.

Reference Tools

A **Word Magnet** can be used to organize information associated with a vocabulary word or term. As shown, write the word or term inside the magnet. Write associated information on the blank lines that "radiate" from the magnet. Associated information can include, but is not limited to: other vocabulary words or terms, definitions, formulas, procedures, examples, and visuals. This type of organizer serves as a good summary tool because any information related to a topic can be included.

Histogram

A histogram is a bar graph that shows the frequency of data values in intervals of the same size.

The height of a bar represents the frequency of the values in the interval.

You can make a histogram from a frequency table. A frequency table groups data values into intervals. The frequency is the number of data values in an interval.
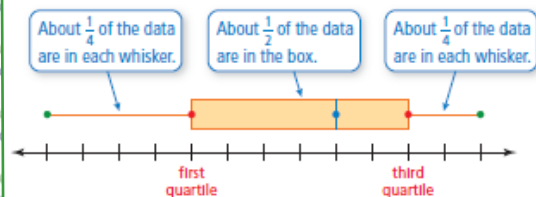
The histogram shows the number of times students were absent from homeroom this year.

Homeroom Absences
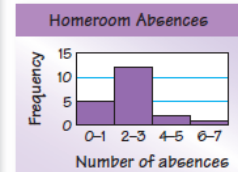
Quick Review

- A stem-and-leaf plot is very similar to a dot plot, but the stem-and-leaf plot gives additional information. The stem-and-leaf plot uses the ones digit of the data values instead of dots, so you can see the distribution within each group of ten.

- If you can draw a line through the median of a box-and-whisker plot, and each side is a mirror image of the other, then the distribution is symmetric.

- You can use a measure of center and a measure of variation to describe the distribution of a data set. The shape of the distribution can help you choose which measures are the most appropriate to use.

- The figure shows how data are distributed in a box-and-whisker plot.

About $\frac{1}{4}$ of the data are in each whisker.   About $\frac{1}{2}$ of the data are in the box.   About $\frac{1}{4}$ of the data are in each whisker.

first quartile   third quartile
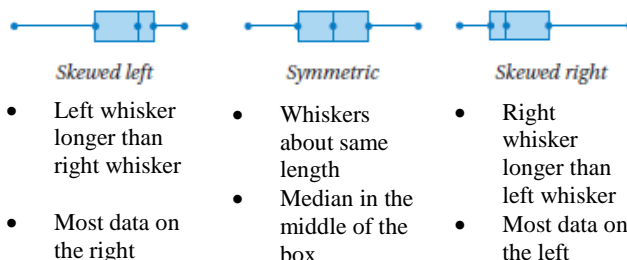
Key Ideas

Histograms

- A **histogram** is a bar graph that shows the frequency of data values in intervals of the same size. The height of a bar represents the frequency of the values in the interval.

Choosing Appropriate Measures

- The mean absolute deviation (MAD) uses the mean in its calculation.
- When a data distribution is *symmetric*,
  - use the mean to describe the center and
  - use the MAD to describe the variation.
- The interquartile range (IQR) uses quartiles in its calculation.
- When a data distribution is *skewed*,
  - use the median to describe the center and
  - use the IQR to describe the variation.

Shapes of Box-and-Whisker Plots

Skewed left

Symmetric

Skewed right

- Left whisker longer than right whisker
- Most data on the right

- Whiskers about same length
- Median in the middle of the box

- Right whisker longer than left whisker
- Most data on the left

What's the Point?

The ability to use data displays is very useful in real life for events like organizing and presenting research. Ask your student to conduct an experiment that interests them. It could be anything from surveying their family or class to weighing fruit at the grocery store. Have them display the data multiple ways. What kind of data display fits the data best? Why?

The STEM Videos available online show ways to use mathematics in real-life situations. The Chapter 10: Choosing a Dog STEM Video is available online at www.bigideasmath.com.

Hmmm.