

## Lesson 5: Dot Plot & Describing the Distribution

### Daily Data Collection

Each student will record the following information on the board:

Hours of sleep last night & minutes you drive in a week.

#### Terms:

##### Describing a distribution:

When describing the overall pattern of a distribution, you **MUST** address the following 4 things.

1. The **CENTER** of the data
2. The **SHAPE** of the data
3. The **SPREAD** of the Data
4. Any **OUTLIERS** in the data

#### Distribution Part 1: Center

##### The Median

The Median splits the graph into 2 equal halves (left area = right area). The number such that half the observations are smaller and the other half are larger.

##### Steps:

1. Arrange the data from least to greatest.
2. Find the middle of the data.
  - a. If there are an odd number of observations, there will be 1 number at the middle. This is the median.
  - b. If there are an even number of observations, the median is the average of the two values that are in the middle of the lined up observations.

#### Distribution Part 2: Shape

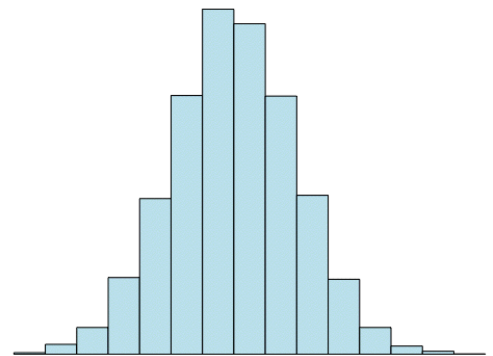
So what types of things should you be looking for when you describe a distribution's **SHAPE**?

Symmetry: A distribution is symmetric if the right and left sides of the histogram are *approximately* mirror images of each other.

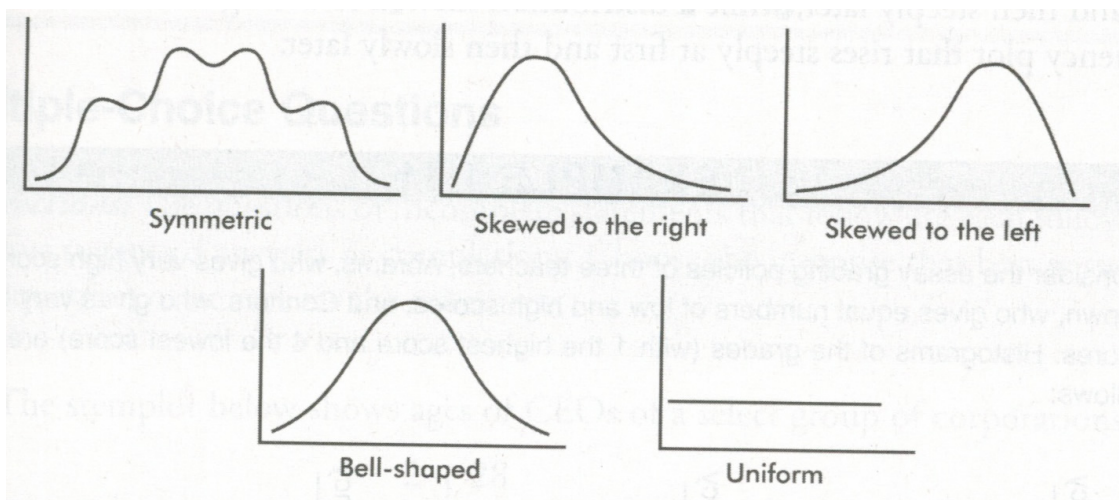
Gaps: holes in the data

Clusters: are the data grouped? Is there a large group that appears unexpected?

Modes: 0, 1 (unimodal), or 2 modes (bimodal)?



## Shape (continued): Skewness



The median is the measure of center, which is resistant to outliers and skewness. The median is the midpoint of a distribution. The Median splits the graph into 2 equal halves (left area = right area). The number such that half the observations are smaller and the other half are larger.

### Distribution Part 3: Spread

We need to know how spread out the data is, or the variability of the observations.

**The Range:** The difference between the largest and smallest observation (max – min).

### Distribution Part 4: Outliers

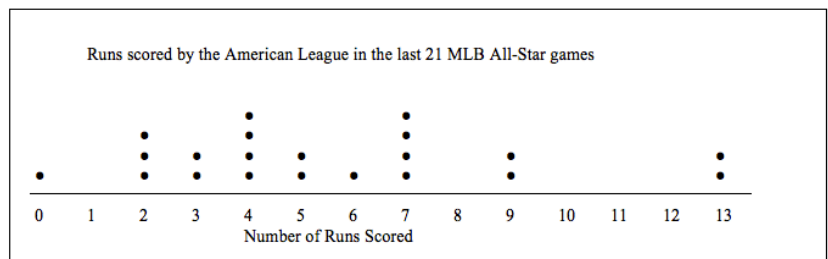
**Outliers:** Observations that are so far above or below the majority of the data that they do not fit.

## Graphs of Quantitative Variables

### The Dot-plot

Things to remember

- ✓ You only need a properly labeled horizontal axis
- ✓ You need to be neat
- ✓ Title the graph
- ✓ Each dot represents a count of 1
- ✓ Works well with a small data set



**Class Data:**

	Hours of sleep	Driving minutes
Create a dotplots for each data set.		
Center – median		
Spread – range		
Shape of the dotplots		
Outliers		

Analysis:

## Guided Practice:

Gooooaaaallllll!

### How to make a dotplot

How good was the 2004 U.S. women's soccer team? With players like Brandi Chastain, Mia Hamm, and Briana Scurry, the team put on an impressive showing en route to winning the gold medal at the 2004 Olympics in Athens. Here are data on the number of goals scored by the team in 34 games played during the 2004 season:<sup>20</sup>

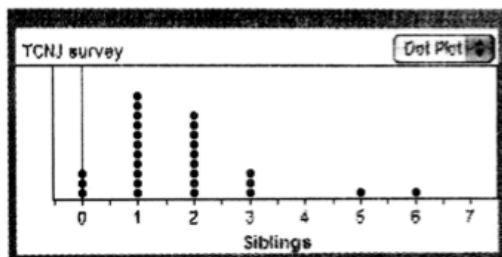
3 0 2 7 8 2 4 3 5 1 1 4 5 3 1 1 3  
3 3 2 1 2 2 2 4 3 5 6 1 5 5 1 1 5

Here are the steps in making a dotplot:

- *Draw a horizontal axis (a number line) and label it with the variable name.* In this case, the variable is number of goals scored.
- *Scale the axis.* Start by looking at the minimum and maximum values of the variable. For these data, the minimum number of goals scored was 0, and the maximum was 8. So we mark our scale from 0 to 8, with tick marks at every whole-number value.
- *Mark a dot above the location on the horizontal axis corresponding to each data value.* Figure 1.9 displays a completed dotplot for the soccer data.

## CHECK YOUR UNDERSTANDING

The Fathom dotplot displays data on the number of siblings reported by each student in a statistics class.



1. Describe the shape of the distribution.
2. Describe the center of the distribution.
3. Describe the spread of the distribution.
4. Identify any potential outliers.