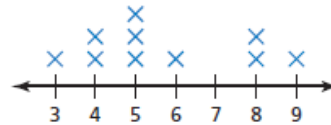# Indicator 36-38 Class Notes by Mrs. Joshi

Create Data Displays

🔑 Key Idea

Line Plots

A **line plot** uses a number line to show the number of times each value in a data set occurs. An "×" is placed above the number line for each data value.

Line plots show how much data are spread out or grouped together. This is called the *distribution* of the data.


EXAMPLE 1 — Making a Line Plot

Ages			
14	18	13	15
16	15	24	14
17	16	18	15
15	19	16	16
24	14	15	17

The table shows the ages of people in a school library. Display the data in a line plot. Describe the distribution of the data.

Step 1: Draw a number line that includes the least and greatest values in the data set. The least age is 13 and the greatest age is 24.

Step 2: Place an "×" above the number line for each data value.
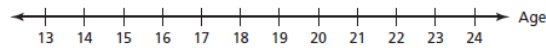
There are two 18-year-old people.
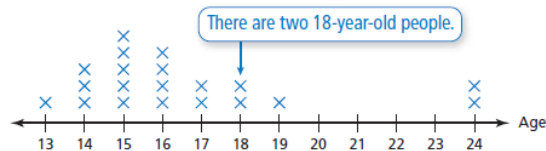
∴ Most of the people are in their teens. Two of the people are 24 years old.

# Indicator 36-38 Class Notes by Mrs. Joshi

🔑 Key Idea

Remember

The *frequency* is the number of data values in an interval. A *frequency table* groups data values into intervals.

Histograms

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

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

Push-Ups

Number of students vs *Number of push-ups*

| 0–9 | 10–19 | 20–29 | 30–39 | 40–49 |
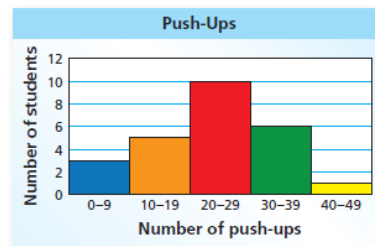
EXAMPLE 2   Making a Histogram

The frequency table shows the number of points that each student in a class earns on a 15-point quiz. Display the data in a histogram.

Step 1: Draw and label the axes.

Step 2: Draw a bar to represent the frequency of each interval.

Points	Frequency
1–3	2
4–6	0
7–9	6
10–12	10
13–15	9

Quiz Scores

Frequency vs *Points*

| 1–3 | 4–6 | 7–9 | 10–12 | 13–15 |
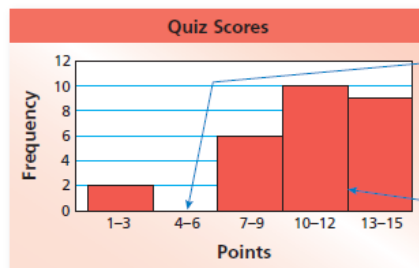
Include any interval with a frequency of 0. The bar height is 0.

There is no space between the bars of a histogram.

Sometimes it is hard to read data in a table. You can use a stem-and-leaf plot to organize large data sets so that they can be read and interpreted easily. In a **stem-and-leaf plot**, the data is ordered from least to greatest and is organized by place value.

SPORTS The number of points scored by the winning team in each NCAA women's basketball championship game from 1982 to 2002 is shown.

NCAA Division I Women's Basketball Points Scored by Winning Teams, 1982–2002						
76	70	56	70	60	68	71
69	97	76	78	70	93	68
72	67	88	84	83	62	82

Source: *The World Almanac*

1. What were the least and greatest number of points scored?
2. Which number of points occurred most often?

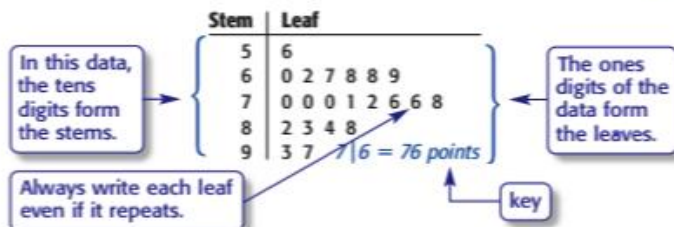**EXAMPLE**   **Construct a Stem-and-Leaf Plot**

1 **SPORTS** Make a stem-and-leaf plot of the data above.

Step 1 Order the data from least to greatest.

56 60 62 67 68 68 69 70 70 70 71
72 76 76 78 82 83 84 88 93 97

Step 2 Draw a vertical line and write the tens digits from least to greatest to the left of the line. These digits form the **stems**. Since the least value is 56 and the greatest value is 97, the stems are 5, 6, 7, 8, and 9.

Step 3 Write the units digits in order to the right of the line with the corresponding stem. The units digits form the **leaves**.

Stem	Leaf
5	6
6	0 2 7 8 8 9
7	0 0 0 1 2 6 6 8
8	2 3 4 8
9	3 7

7|6 = 76 points

In this data, the tens digits form the stems.

The ones digits of the data form the leaves.

Always write each leaf even if it repeats.

key

Step 4 Include a **key** that explains the stems and leaves.

Indicator 36-38 Class Notes by Mrs. Joshi

Data Distributions

Resource:
https://mathbitsnotebook.com/Algebra1/StatisticsData/STShapes.html

● **Shapes of Distributions** (the graphs):

Histograms	Dot Plots	Box Plots
Note: The graphs shown below demonstrate the *shapes* of various sets of data. The histogram, dot plot and box plot in each separate section represent the same data set.		

Symmetric (bell shaped) - when graphed, a vertical line drawn at the center will form mirror images, with the left half of the graph being the mirror image of the right half of the graph. In the histogram and dot plot, this shape is referred to as being a "bell shape" or a "mound". The *most typical* symmetric histogram or dot plot has the highest vertical column in the center. This shape is often referred to as being a "normal curve" (or normal distribution). Not all symmetric graphs, however, have this shape (see Symmetric U-shaped below).

Symmetric (U-shaped) - as mentioned above, a symmetric graph forms a mirror image of itself when reflected in its vertical center line. Unlike the previous graphs, these histograms and dot plots have more of a U shape.

Skewed Right (positively skewed) - fewer data plots are found to the right of the graph (toward the larger numeric values). The "tail" of the graph is pulled toward higher positive numbers, or to the right. The mean typically gets pulled toward the tail, and is greater than the median. (There may be exceptions to the this last statement.)
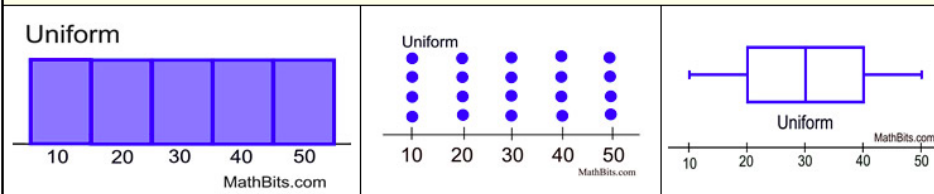
Indicator 36-38 Class Notes by Mrs. Joshi

Data Distributions

Skewed Left (negatively skewed) - fewer data plots are found to the left of the graph (toward the smaller numeric values). The "tail" of the graph is pulled toward the lower or negative numbers, or to the left. The mean typically gets pulled toward the tail, and is less than the median. (There may be exceptions to the this last statement.)
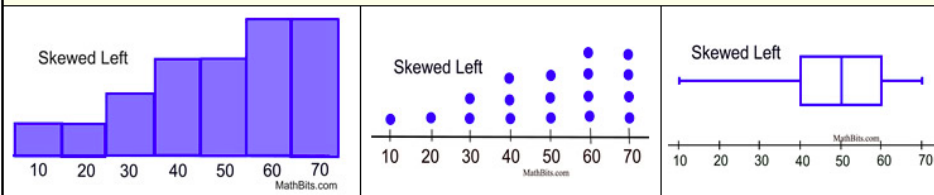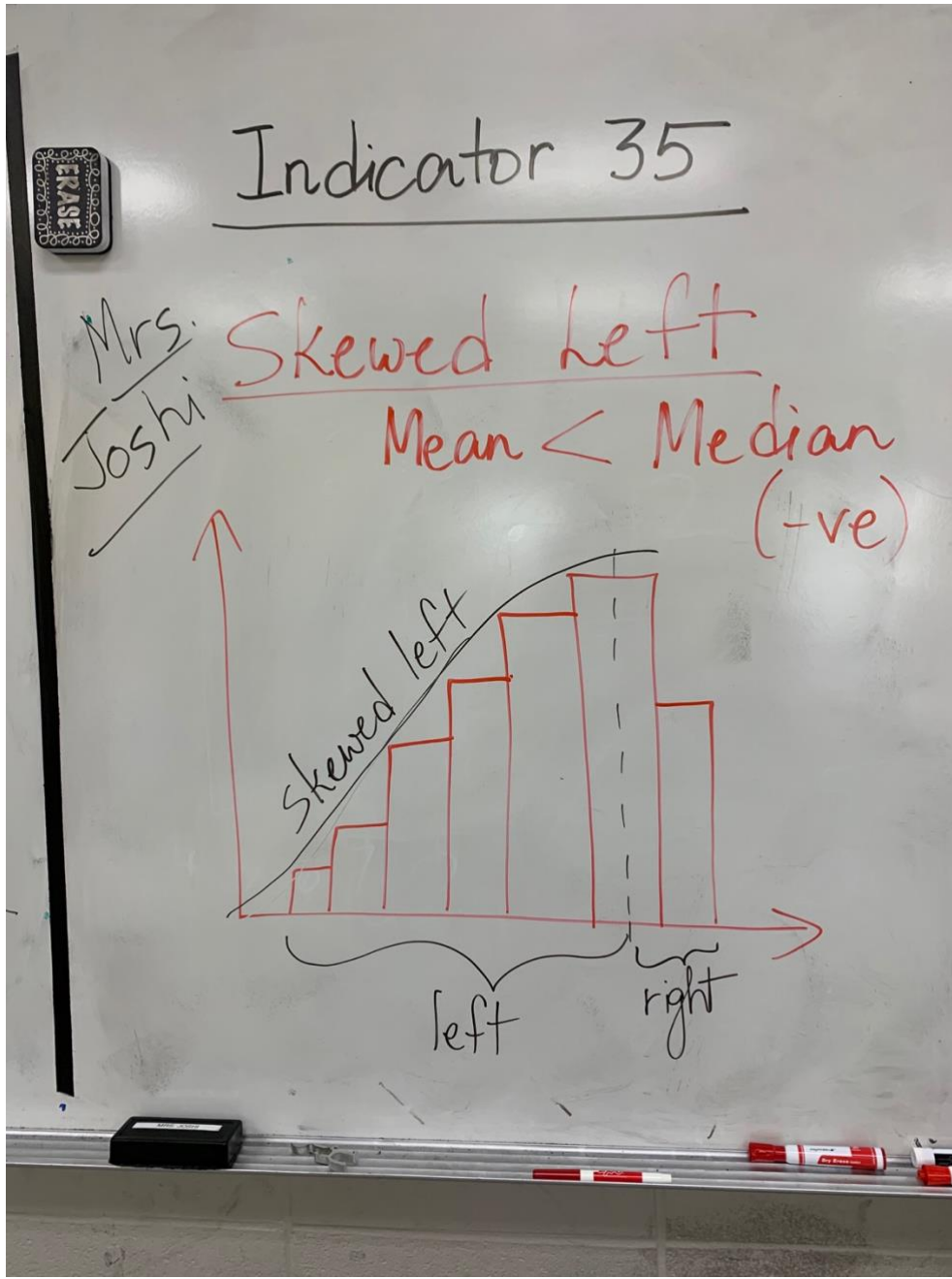

Uniform - The data is spread equally across the range. There are no clear peaks in these graphs, since each data entry appears the same number of times in the set. Notice in the boxplot how each section is of equal length: min to Q_1, Q_1 to median, median to Q_3, and Q_3 to max. These graphs are also symmetric.

Data Distributions

Data Distributions

Data Distributions