# Warm-Up 4/17/18

# Bring out your HW on....

## Day 1: Measures of Central Tendency

2. A website captures information about each customer's order. The total dollar amounts of the last 8 orders are listed below.

| Order | Dollar amount |
|---|---|
| 1 | 21 |
| 2 | 15 |
| 3 | 22 |
| 4 | 26 |
| 5 | 24 |
| 6 | 21 |
| 7 | 17 |
| 8 | 22 |

a. What is the mean absolute deviation?

$\bar{X} = 21$

$0+6+1+5+3+0+4+1$

$= \frac{20}{8} = 2.5$

M.A.D = $2.50

b. What does the mean absolute deviation mean in context of the problem scenario?

The dollar amounts of the orders are close to each other.

3. A company keeps track of the age at which employees retire. It is considered an early retirement if the employee retires before turning 65. The age of 11 employees who took early retirement this year are listed in the table.

| Employee | Age at early retirement |
|---|---|
| 1 | 56 |
| 2 | 55 |
| 3 | 60 |
| 4 | 51 |
| 5 | 53 |
| 6 | 58 |
| 7 | 56 |
| 8 | 64 |
| 9 | 59 |
| 10 | 42 |
| 11 | 48 |

a. Find the values of Q1, Q2, and Q3.

median

Q1 = 51
Q2 = 56
Q3 = 59

b. Find the interquartile range.

IQR = Q3 − Q1
= 59 − 51
= 8

c. Are there any striking deviations in the data?

Possibly 42 years old is too far from 65.

**4.**

$$\frac{85+80+90+93+X}{5} = 90$$

$$5\left(\frac{348+X}{5}\right) = 90 \times 5$$

$$348 + X = 450$$

$$-348 \quad -348$$

$$X = 102$$

You need to make 102 on the 5th test to have a 90 average in the class.

# Home Work - 4/17/18

# 1. Day 1: Measures of Central Tendency & Spread # 1 - 8c Tuesday 4/18/18

# Unit 6 4/17/18

## Essential Question

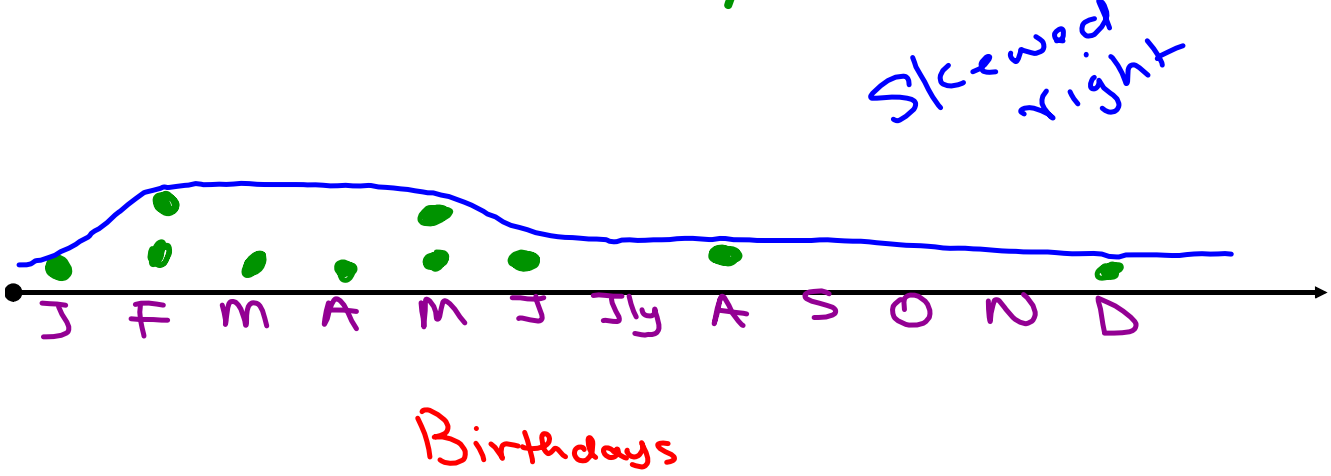
How can we use Dot Plots, Histogram, and Box Plots to understand the spread of data?

# Unit 6: Describing Data

## Standard for Today:

**MGSE9-12.S.ID.1** Represent data with plots on the real number line (dot plots, histograms, and box plots). Choose appropriate graphs to be consistent with numerical data: dot plots, histograms, and box plots.

# Dot Plot for Birthdays

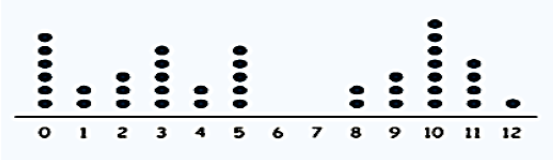


# Notes 4/17/18

## Day 2 - Dot Plots & Histograms

A **dot plot** is a data representation that uses a number line and x's, dots, or other symbols to show frequency. The number of times a value is repeated corresponds to the number of dots above that value. A dot plot also shows the size of the data set. Dot plots are also called line plots. An example of a dot below is below:

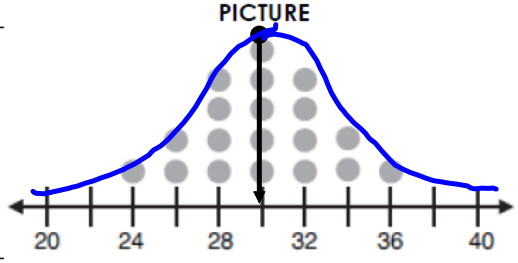
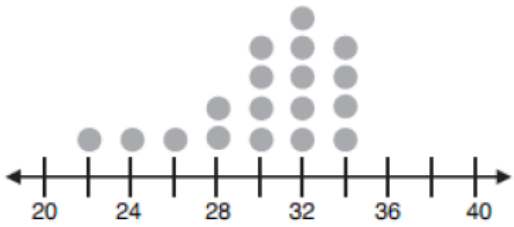
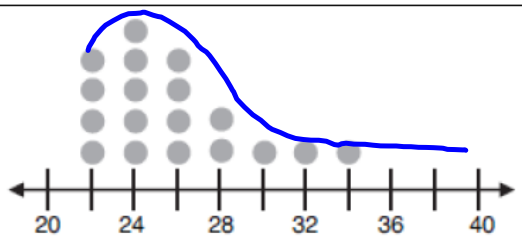
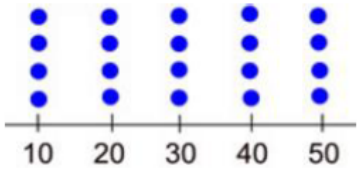
| Minutes | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| People | 6 | 2 | 3 | 5 | 2 | 5 | 0 | 0 | 2 | 3 | 7 | 4 | 1 |




**Advantages of Dot Plots:**
Simple to make
Shows each individual data point

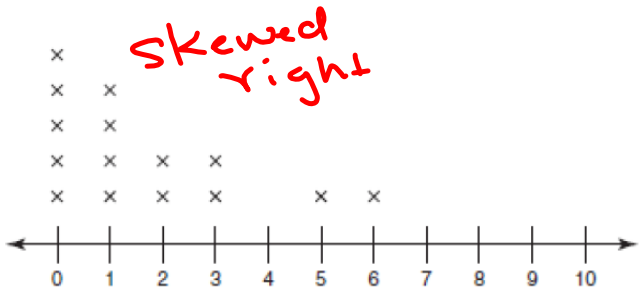
**Disadvantages of Dot Plots:**
Can be time consuming with lots of data points
Have to count to get exact total
Fractions are hard to display

**Types of Dot Plot Distributions**

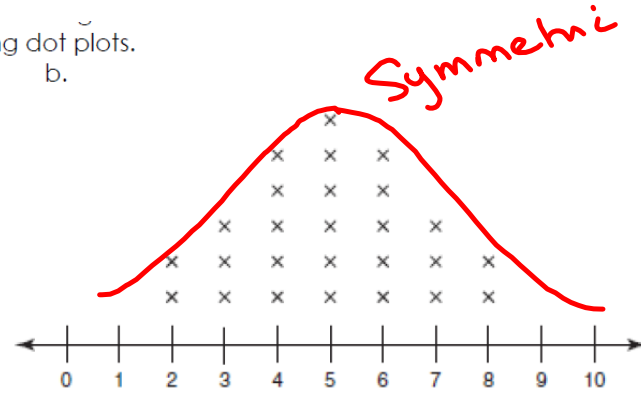
| TYPE | DESCRIPTION | PICTURE |
|---|---|---|
| **SYMMETRIC** | When graphed, a vertical line drawn at the center will form mirror images.<br><br>This shape is referred to as the bell shaped curve or normal curve<br><br>Mean is approximately equal to the median |  |
| **SKEWED LEFT**<br><br>(NEGATIVE SKEW) | Fewer data points are found to the left of the graph (towards the smaller data values). The "tail" of the graph is to the left.<br><br>Typically, the mean is less than or to the left of the median. |  |
| **SKEWED RIGHT**<br><br>(POSITIVE SKEW) | Fewer data points are found to the right of the graph (towards the bigger data values). The "tail" of the graph is to the right.<br><br>Typically the mean is greater than or to the right of the median |  |
| **UNIFORM** | The data is spread equally (or very close to equally) across the range.<br><br>Uniform distributions are a type of symmetric distributions. |  |

**Practice 1**: Identify the type of distribution of the following dot plots.

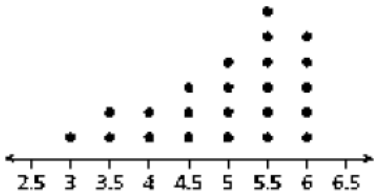
a.




b.



**Practice 2**: Find the following values:



Describe the following:

Mean: 4.25

Median: 4.25

Mode: 4 and 4.5

Range: 5.5 − 3 = 2.5

Distribution: Symmetric

Mean: 4.97

Median: 5

Mode: 5.5

Range: 6 − 3 = 3

Distribution: skewed left

Mean: 4.43

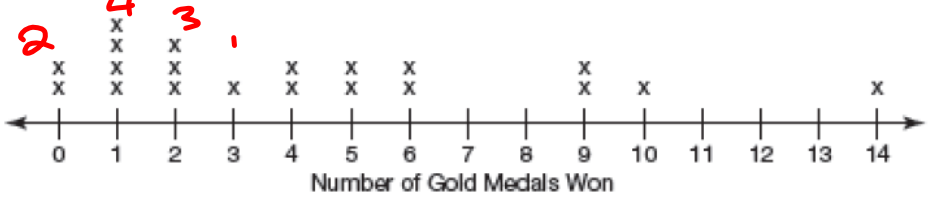
Median: 4.5

Mode: 3 and 5

Range: 6 − 3 = 3

Distribution: Uniform

**Practice 3:** The following dot plot represents gold medals won at the Special Olympics:




a. How many participants are represented in the dot plot?

20 participants

b. How many participants won10 or more medals?

2 participants

c. How many participants won less than 4 medals?

10 participants

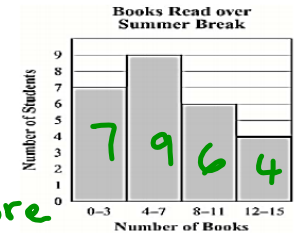
d. Describe the data distribution and interpret its meaning in terms of this problem situation

Right skewed

# Histograms

A **histogram** is a bar graph used to display the frequency of data divided into equal intervals, called **bins**. The bars must be of equal width and should touch, but not overlap. The height of each bar gives the frequency of the data.

An example of a histogram is below:

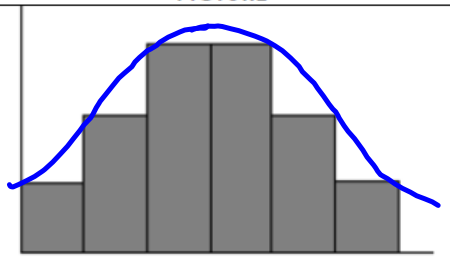
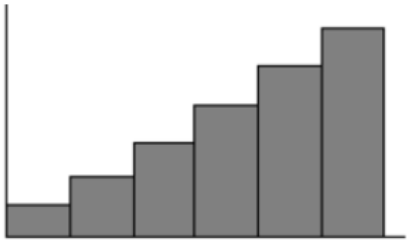
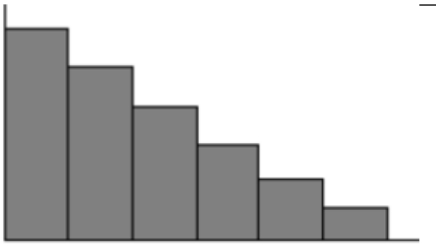
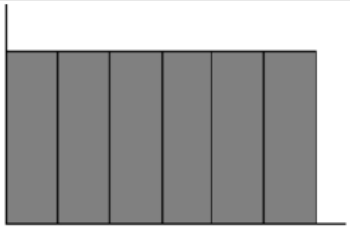



How many students read 4-7 books? 9

How many more students read 4-7 books than 12-15 books? 5 more

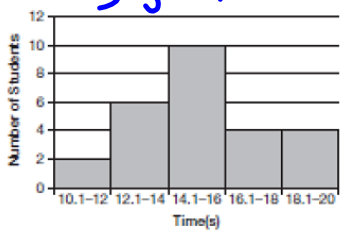
**Advantages of Histograms:**
Good for determining the shape of data
Convenient for representing large quantities of data

**Disadvantages of Histograms:**
Cannot read exact values because data is grouped into categories
More difficult to compare two data sets because measures of center and spread cannot be determined

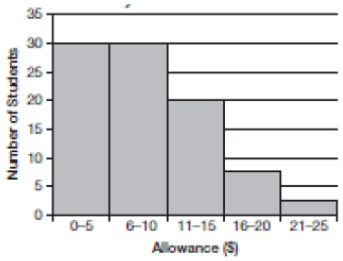
| TYPE | DESCRIPTION | PICTURE |
|---|---|---|
| **SYMMETRIC** | When graphed, a vertical line drawn at the center will form mirror images.<br><br>This shape is referred to as the bell shaped curve or normal curve<br><br>The median will be in or close to the center of the number line. |  |
| **SKEWED LEFT**<br><br>(NEGATIVE SKEW) | Fewer data points are found to the left of the graph (towards the smaller data values). The "tail" of the graph is to the left.<br><br>The median will be shifted right and the "tail" on the left. Typically, the mean is less than or to the left of the median. |  |
| **SKEWED RIGHT**<br><br>(POSITIVE SKEW) | Fewer data points are found to the right of the graph (towards the bigger data values). The "tail" of the graph is to the right.<br><br>The median will be shifted left and the "tail' on the right. Typically the mean is greater than or to the right of the median |  |
| **UNIFORM** | The data is spread equally (or very close to equally) across the range.<br><br>Uniform distributions are a type of symmetric distributions.<br><br>The median will be in or close to the center of the number line. |  |

**Practice 1:** Describe the distribution of each histogram and if the mean is less, greater, or equal to the median. Then describe which would be a better measure of center; the median or mean.

a. Symmetric




b.




Skewed right

**Practice 2:** Use the histogram to answer the following questions about how long it takes students to get ready.

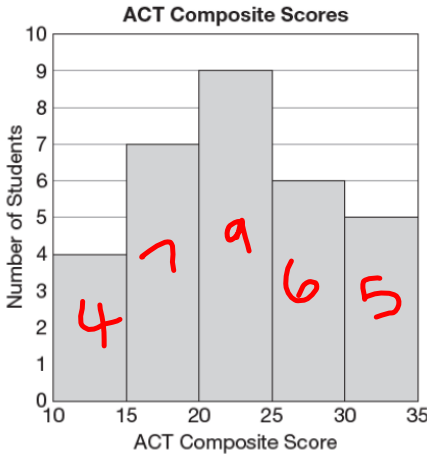
a. How many students answered the question? 15

b. How many students take less than 40 minutes to get ready? 10


c. Based on the info given, could you redraw the current histogram with intervals half their current size? Why or why not?

Yes you can redraw the current histogram with intervals half their current size since the x-values represent minutes. The length of each bar would be 4.5.

**Practice 3:** Analyze the given histogram which displays the ACT composite score of several randomly chosen students.




a. Describe the distribution and explain what it means in terms of the problem situation.

Symmetric.

b. How many students had an ACT score of at least 20?

9+6+5=20

c. How many students had an ACT score less than 30?

4+7+9+6=26

d. How many students had an ACT score of exactly 25?

Cannot tell exactly, but about 15 student scored between 20 and 30.