

3-29-19

Aim: *SWBAT* use measures of central tendency to describe and interpret data.

HW: Packet Page 8

Do Now: Packet Page 6

## Homework - Random Samples

1. The School board wants to study computer literacy among teachers. Which would represent a random sample of teachers
- All high school math teachers
  - Teachers from the middle school whose name begins with N
  - All male teachers
  - Every eighth teacher on an alphabetical list

2. An on-line bookseller randomly chooses 200 book buyers from its database and then surveys those book buyers to find out if they were satisfied with the time it took to deliver their orders. Explain if the bookseller's survey is biased or not.

The survey seems unbiased because the buyers were selected at random.

3. Milena surveys 80 high school students who are leaving a jazz concert to determine the favorite type of music among high school students. Explain whether or not Milena's survey is biased.

It is biased. Chances are, the students like Jazz is they are at a Jazz concert.

4. Max wants to find out the exercise habits of local children. He plans to survey every third child he sees coming out of a sporting goods store. Max says his sample is not biased. Do you agree or disagree? Explain.

I disagree. If the child plays sports, they exercise. The sample is not random enough to represent the entire population of local children.

- \* 5. A researcher catches 60 fish from different locations in a lake. He then tags the fish and puts them back in the lake. Two weeks later, the researcher catches 40 fish from the same locations. 8 of these fish are tagged. Predict the number of fish in the lake using a proportion.

~~$$\frac{60}{n} = \frac{8}{40}$$

$$n = 300$$~~

6. A high school has 1800 students. A random sample of 80 shows that 24 kids have cell phones. Predict the number of students in the entire high school who have cell phones using a proportion.

$$\frac{24}{80} = \frac{x}{1800}$$

$$\frac{80x}{80} = \frac{43200}{80}$$

$$x = 540$$

7. In a random sample, 3 of 400 computer chips are found to be defective. Based on the sample, about how many chips out of 100,000 would you expect to be defective

- a. 750  
b. 3000  
c. 4000  
d. Cannot be Determined

$$\frac{3}{400} = \frac{x}{100,000}$$

$$\frac{400x}{400} = \frac{300,000}{400}$$

$$x = 750$$

8. A mint produces 150,000 souvenir coins each year. In a random sample of 400 coins, 3 have a misprint. Predict the number of coins that will have misprints in a year.

$$\frac{3}{400} = \frac{x}{150,000}$$

$$\frac{400x}{400} = \frac{450,000}{400}$$

$$x = 1125$$

9. Zach chooses a random sample of 50 out of 400 students. He finds that 7 of them have traveled to a foreign country. Zach claims that over 50 out of all 400 students have traveled to a foreign country. Do you agree or disagree. Explain your answer on the lines below.

$$\frac{7}{50} = \frac{x}{400}$$

$$\frac{50x}{50} = \frac{2800}{50}$$

$$x = 56$$

Circle one:  agree  disagree

If  $\frac{7}{50}$  is the sample, that means based on the data  $\frac{56}{400}$  students could have traveled to a different country.

**Aim:** SWBAT calculate the three different measures of central tendency.

**Do Now:** Read about "Measures of Central Tendency" and use the information to calculate all parts of questions 1 and 2.

### Measures of Central Tendency

**Mean:** A type of average calculated by finding the sum of the values and dividing it by the number of values.

**Median** - A type of average that is the middle value of the data set when the values are written in numerical order. If a data set has an even number of values, the median is the mean of the two middle values.

**Mode** - A type of average calculated by determining which value occurs most often in a data set. A data set can have no mode, one mode, or more than one mode.

#1	#2
Data: <del>1, 1, 2, 2, 3</del>	Data: <del>1, 1, 2, 2, 3, 3</del>
Mean $\frac{(1+1+2+2+3)}{5} \rightarrow \frac{9}{5} \rightarrow 1.8$	Mean $\frac{(1+1+2+2+3+3)}{6} \rightarrow \frac{12}{6} \rightarrow 2$
Median <p style="text-align: center;">2</p>	Median $\frac{2+2}{2} \rightarrow 2$
Mode <p style="text-align: center;">1 and 2</p>	Mode <p style="text-align: center;">NO MODE</p>

Complete each table.

#3	#4
Data: <del>-3</del> , 44, <del>-11</del> , 9, <del>-21</del>	Data: $12\frac{1}{2}$ , $14\frac{3}{4}$ , $20\frac{1}{2}$ , $16\frac{3}{4}$
Mean $\frac{(-21 + (-11)) + (-3) + 9 + 44}{5}$ $\rightarrow \frac{18}{5}$ $\rightarrow 3.6$	Mean $\frac{(12\frac{1}{2} + 14\frac{3}{4} + 16\frac{3}{4} + 20\frac{1}{2})}{4}$ $\rightarrow \frac{64\frac{1}{2}}{4} \rightarrow 16\frac{1}{8}$
Median $-21, -11, (-3), 9, 44$	Median $12\frac{1}{2}   14\frac{3}{4}, 16\frac{3}{4}   20\frac{1}{2}$ $\frac{(14\frac{3}{4} + 16\frac{3}{4})}{2} \rightarrow \frac{31\frac{1}{2}}{2} \rightarrow 15\frac{3}{4}$
Mode NO MODE	Mode NO MODE

#5	#6
Data: 9, 7, 4, 9, 4, 10, 5, 14, 9, 4	Data: 14, 13, 20, 24, 15, 10, 22, 17, 18
Mean $\frac{(4+4+4+5+7+7+9+9+9+10+14)}{10} = \frac{75}{10} = 7.5$	Mean
Median $\frac{7+9}{2} = \frac{16}{2} = 8$	Median
Mode 4 and 9	Mode

## HOMEWORK

#7	#8
<b>Data:</b> 19, 16, 23, 35, 28, 20, 16, 36, 13, 26, 29, 31	<b>Data:</b> 19, 16, 23, 35, 28, 20, 16, 36, 98, 13, 26, 29, 31
<b>Mean</b>	<b>Mean</b>
<b>Median</b>	<b>Median</b>
<b>Mode</b>	<b>Mode</b>

#9	#10
<b>Data:</b> 58, 67, 94, 85, 78, 76, 99, 100, 88, 76, 82, 81, 94, 98	<b>Data:</b> 58, 67, 94, 85, 78, 76, 6, 99, 100, 88, 76, 2, 82, 81, 94, 98
<b>Mean</b>	<b>Mean</b>
<b>Median</b>	<b>Median</b>
<b>Mode</b>	<b>Mode</b>