Name: _____ Group: A B C

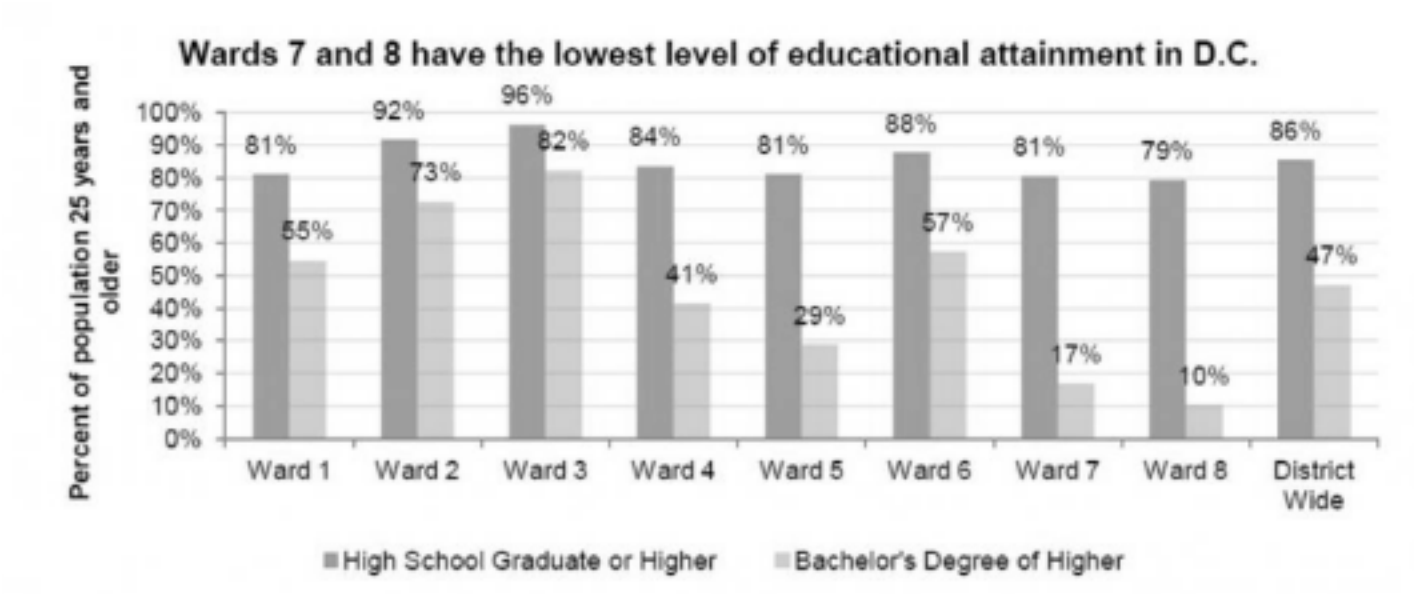
Date: Tuesday, February 26th, 2019 Class: _____

# Introduction to Statistics (Module 5, Lesson 13 and 14)

Objective: SWBAT use mean, median, mode, and range of a sample in order to describe the population as a whole.

Standard: 7.SP.A.1 and 7.SP.A.2

## Do Now: Stop and Jot




Source: Joy Phillips, *2005-2009 American Community Survey – Key Demographic Indicators* (Washington, D.C.: D.C. State Data Center, 2011).

1) What do you notice about the graph above? _____

_____

_____

_____

2) Kelly Miller Middle School is in Ward 7. How does Ward 7 compare to the rest of the city? _____

_____

_____

_____

3) Do you think education matters? Why or why not? _____

_____

_____

_____

## Class Notes: Review of Random Sampling

The data from the Do Now was collected from the *American Community Survey*. This survey is sent by mail to 4 million people chosen by lottery (where any name can be chosen if pulled out) across the USA each year (there are 328 million people in America).

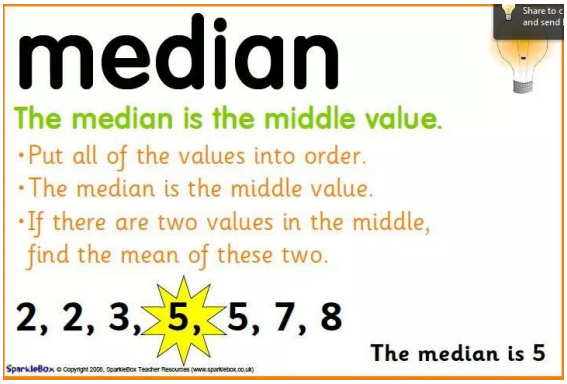
In reference to yesterday's class, what is the.....

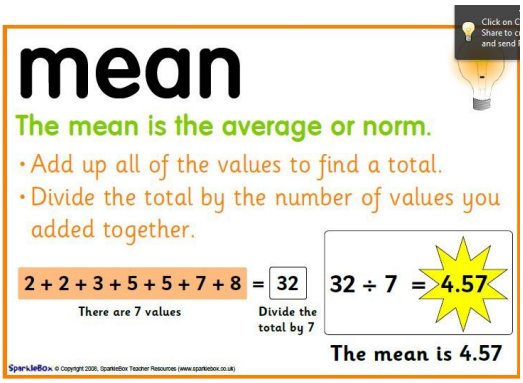
Name the population. _____

How many people are in the sample? _____

Is this a random sample? How do you know?

## Anchor Chart




## Guided Practice: Mean and Median from a Random Sample

From the *American Community Survey,* we took 10 random samples of people's income last year.

| Yearly Income (Rounded to the Nearest Dollar) | | | | | |
|---|---|---|---|---|---|
| Bachelor's Degree or Higher | $45,687 | $598,091 | $53,091 | $34,985 | $72,743 |
| Less than a High School Education | $35,453 | $14,011 | $5,071 | $67,092 | $15,810 |

1) We calculate the ***mean*** or ***average*** by *adding up everything in a sample and then dividing by the number of samples.*

*(Watch me)* The **mean** income for those with a bachelor's degree or higher is: _____

$$\frac{\textit{all salaries of those with a bachelor's degree}}{\textit{the number of people with a bachelor's degree in our sample}}$$

| Yearly Income (Rounded to the Nearest Dollar) | | | | | |
|---|---|---|---|---|---|
| Bachelor's Degree or Higher | $45,687 | $598,091 | $53,091 | $34,985 | $72,743 |
| Less than a High School Education | $35,453 | $14,011 | $5,071 | $67,092 | $15,810 |

*(You try)* The **mean** income for those with less than a high school education is is:_____

$$\frac{\textit{all salaries of those with less than a high school diploma}}{\textit{the number of people with a less than a high school diploma in our sample}}$$

The real average (mean) salary for those with a bachelor's degree is $57,252 per year, and for those with less than a high school diploma is $25,376. How did our averages compare? Why do you think that is?

_____

_____

_____

2) We can also calculate the **median**, or "middle" of our data.

*(Watch me)* The **median** income for those with a bachelor's degree or higher is:_____

*Re − order your data from least to greatest. Count out the numbers, and divide by 2 to find the middle number.*

*(You try)* The **median** income for those with less than a high school education is:_____

*Re − order your data from least to greatest. Count out the numbers, and divide by 2 to find the middle number.*

3) Why do you think taking a median is sometimes more useful than a mean? *(Hint: Think about the 2nd datapoint for the people with bachelor's degrees.)*

_____

_____

_____

4) Think back to the Do Now: Using the information you just discovered, why would it matter if people in certain parts of the city tend to have less education than others?

_____

_____

_____

**Practice and Score**

Ms. Wilkins took a random sample of 7 students in her 6th period class and looked at their current grades. She got the following grades:

*77%, 62%, 98%, 13%, 82%, 73%, 85%*

1) What is the mean grade in her class? _____

2) What is the median grade in her class? _____

3) Is this a good sample for the average grades at Kelly Miller? Why or why not?

| | | |
|---|---|---|
| Mild (0-1 correct) | Medium (2-3 correct) | Spicy (4 correct) |

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**Differentiated Practice**

For all exercises, consider the following two randomly selected samples for how many hours of Fortnite teenage boys play each week

| Hours spent on Fortnite each week | | | | | |
|---|---|---|---|---|---|
| *Sample 1:* Random Sample of Xbox Owners | 15 | 21 | 3 | 5 | 10 |
| *Sample 2:* Random Sample of Students | 8 | 9 | 9 | 0 | 14 |

Mild and Medium

1) What is the average number of hours spent on Fortnite in sample 1? _____ Sample 2? _____

2) What is the median number of hours spent on Fortnite in sample 1? _____ Sample 2? _____

3) Which sample was taken more randomly? How did this impact the average number of hours?

Spicy

Describe what is happening in the table using as many statistical terms as possible.

**Introduction to Statistics (Module 5, Lesson 13 and 14) Exit Ticket**

**Exit Ticket**

A large company has offices in cities across the country. The facilities director of the company was asked to survey employees about their office furniture. Rather than survey all employees in the company, the director decided to take a sample of employees. Which groups would be **most** representative of the opinions of all employees in the company?

Select **each** correct answer.

- ☐ A. employees with office phone numbers ending in 3 and 7
- ☐ B. randomly selected employees in the cafeteria of one of the offices
- ☐ C. employees who have worked for the company for more than 10 years
- ☐ D. 5% of randomly selected employees from each office location
- ☐ E. employees answering phone calls in the company's customer service department
- ☐ F. employees who are randomly selected by a computer from a list of all company employees

How comfortable do you feel about statistics (circle a number, 5 being the highest)? 1 2 3 4 5

Why? _____

_____

_____

_____

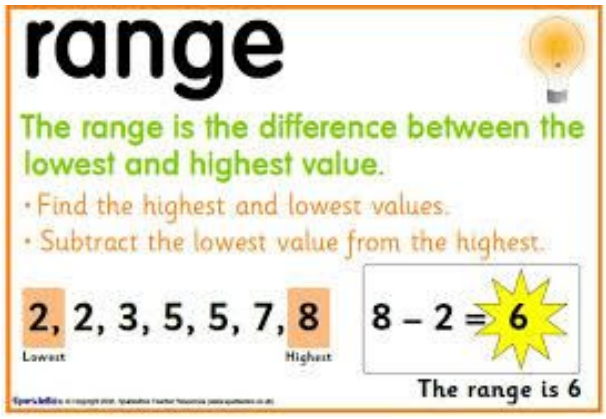
Name: _____ Group: A B C

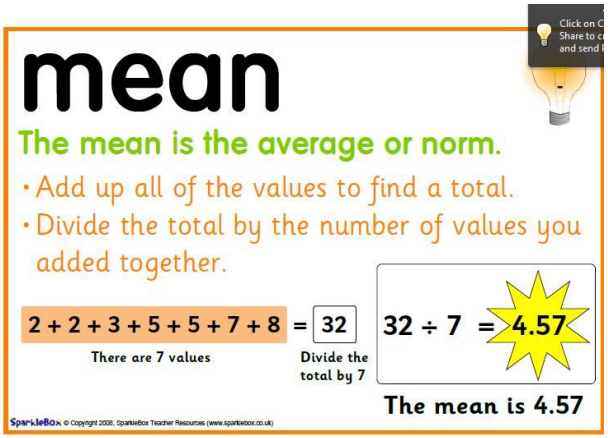
Date: Tuesday, February 12th, 2019 Class: _____

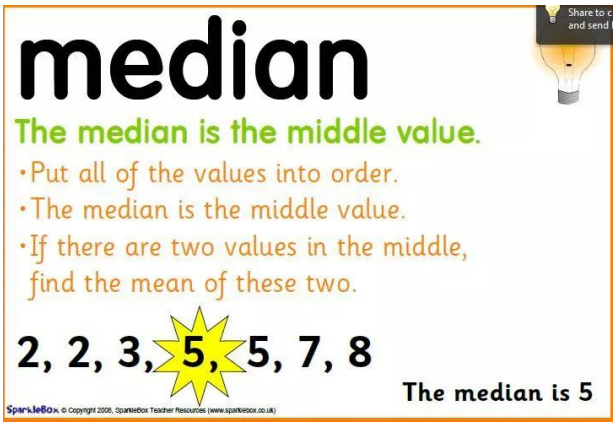
**DATE DUE: Wednesday, February 13th, 2019**

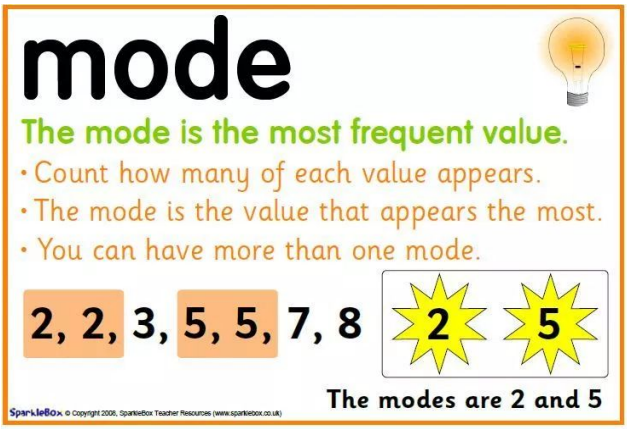
**7th Grade (Homework)**

Homework Helper




1) 18, 24, 17, 21, 24, 16, 29, 18 Mean_____ Median_____ Range_____

2) Cassandra's Candles sold the following number of candles over the last 6 days: 25, 48, 25, 33, 57, 50. What was the average number of candles sold each day?

3) Brian was comparison shopping for DVD players. He decided he wanted to purchase a DVD player that was in the middle of the price ranges. The prices he was quoted include the following: $59.99, $219.99, $79.99, $84.99, $159.99, $109.99, $35.99. Which DVD player did Brian select?

**Homework Helper**

Determine whether the cost of coffee is proportional to the number of pounds. Explain your reasoning.

| Coffee (pounds) | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Cost (dollars) | 3 | 6 | 9 | 12 |

Write the rate of coffee to cost for each pound of coffee in simplest form.

$\frac{1}{3}$ $\frac{2}{6}=\frac{1}{3}$ $\frac{3}{9}=\frac{1}{3}$ $\frac{4}{12}=\frac{1}{3}$ All the rates are equal.

The cost is proportional to the number of pounds.

**Find the ratio of *y* to *x* for Table 1 and Table 2, simplify the fraction to simplest form, and answer the questions that follow.**

**Table 1:**

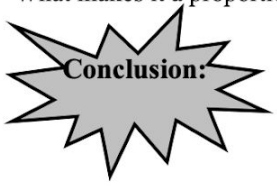
| Number of Hours | Total Cost ($) | Ratio: $\frac{y}{x}$ |
|---|---|---|
| 1 | $75 | |
| 2 | $120 | |
| 3 | $165 | |
| 4 | $210 | |
| 5 | $255 | |

**Table 2:**

| Number of Hours | Total Cost ($) | Ratio: $\frac{y}{x}$ |
|---|---|---|
| 1 | $45 | |
| 2 | $90 | |
| 3 | $135 | |
| 4 | $180 | |
| 5 | $225 | |

**3]** Which table shows a proportional relationship?

**4]** What makes it a proportional relationship?




**To determine proportionality from a table,**

_____.