Lesson Plan

Text: Financial Algebra

Volume: _____   **Chapter:** __5 Automobile Ownership___

Unit number : __5-2___   **Title of unit: Buy or Sell a Car**

Developed by: Maureen Moore   **(maureen.moore@wvsd.org)**

Date: June 26, 2012

Short Description (Be sure to include where in your unit this lesson takes place):

Students will collect data and use quartiles, median, median, mode to make decisions. They will research for real life information on cars and present logical conclusions.

LESSON PLAN

TEACHER: Teacher Prep/ Lesson Plan

- **Lesson Objectives (Students will be able to:)**
  - Compute mean, median, mode, range, quartiles, and interquartile range

- **List of prerequisite skills needed:**
- Student will need basic understanding of data collection minimal understanding of statistical calculation.
- Basic activity for students to complete a simple data collection, example shoe size, height, race, grade level, etc.

- **Vocabulary:**
    statistics, data, measures of central tendency, mean, arithmetic average, outlier, median, ascending order, descending order, skew, resistant, range, quartiles, lower quartile, upper quartile, subscripts, interquartile range (IQR), mode, bimodal

- **State Standards addressed:**
  Math: (Math)

  S-ID2: Summarize, represent and interpret data on a single count or measurement variable

  S-ID3: Summarize, represent, and interpret data on a single count or measurement variable

  S-ID4: Summarize, represent, and interpret data on a single count or measurement variable

  Reading: (Reading)
  Writing: (Writing)
  Leadership:

- **Teacher Preparation:**
- Computer and data research such as Kelly Blue Book, NADA, Consumer Reports, Edmunds.com, Autotrader.com, cars.com, etc
- Understanding of Mean, Median, Mode and Quartiles
- **Content Delivery:**
- **Day 1:** Start with Lab Activity on Data Collection compile data and review mean, median, mode
- **Days 2-3:** Read section 5-2 Buy or Sell a Car and work through the problems.
- **Day 4:** Break students into groups of 2-3 and have each group decide on a data source to gather information and use for statistical calculations. (example: shoe size, height, hair color, eye color, etc) Students will need to prepare a chart to demonstrate the results and make predictions**.**
- **Day 5:** Students will find 5-10 prices for a used car prices comparing the same general type of car. (a set of parameters will be given (example: 4 door sedan, 2 door sports car, SUV, Pickup, model year range +/- 3 years, Mileage range +/- 20,000 miles, etc) They will use that data to find the mean price they can expect to pay for a vehicle.

- **Instructional Documents**
  Quiz 1
  Quiz 2
- **Assessment Tool used in this Lesson** *(scoring method, guide, or rubric)*

- **Reinforcement/Intervention/Extension Activities**

- **Career Applications**
   Have students discuss the benefits or pitfalls of knowing how to evaluate data to make decisions. How does this apply to the career choice they are considering?

Automobile Ownership
Section 5-2 Buy and Sell a Car
Quiz 1 Using statistics to evaluate data

Name _____

Part A

Define the following terms using appropriate Mathematical terms

1. MEAN

2. MODE

3. MEDIAN

4. QUARTILE

5. OUTLIER

6. When the mead of a data set is not the same as the median, the data is _____?

Part B

Phillip wants to purchase a PSP3 for his brother. He has looked around and found several listed, the prices are: $235, $316, $185, $192, $250, $101, $220, $248. Use these numbers to calculate the following:

7. MEDIAN

8. RANGE

9. THIRD QUARTILE

10. ARE THERE ANY OUTLIERS?

Use the scores from the last test in Mr. Smith's Psychology class to determine the quartile values and any outliers: 72, 88, 87, 92, 98, 100, 86, 85, 89, 88, 88

11. Lower Quartile

12. Median Quartile

13. Upper Quartile

14. Interquartile Range

15. List Quartile boundaries and any outliers

Automobile Ownership
Section 5-2 Buy and Sell a Car
Quiz 1 Using statistics to evaluate data

Name _____

Part A

Define the following terms using appropriate Mathematical terms

1. MEAN   **the arithmetic average**
2. MODE   **the most common number in sample**
3. MEDIAN   **the middle score**
4. INTERQUARTILE RANGE   the **range of the middle 50% of numbers**
5. OUTLIER   **a piece of data that is extremely different than the rest of data**
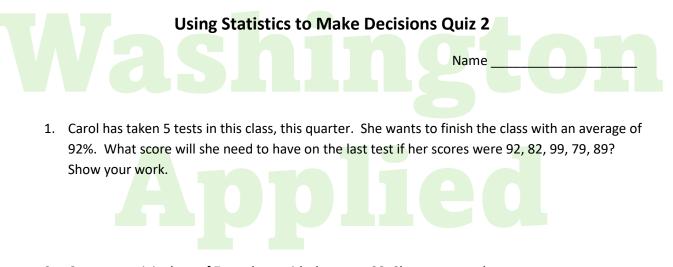6. When the mead of a data set is not the same as the median, the data is ____**skewed**_____?

Part B

Phillip wants to purchase a PSP3 for his brother. He has looked around and found several listed, the prices are: $235, $316, $185, $192, $250, $101, $220, $248. Use these numbers to calculate the following:

7. MEDIAN $**227.5**
8. RANGE   **$ 215**
9. THIRD QUARTILE   **$249.5**
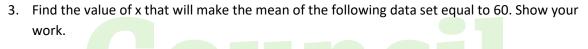10. ARE THERE ANY OUTLIERS?   **Yes, $101**

Use the scores from the last test in Mr. Smith's Psychology class to determine the quartile values and any outliers: 72, 88, 87, 92, 98, 100, 86, 85, 89, 88, 88

11. Lower Quartile   **86**
12. Median Quartile   **88**
13. Upper Quartile   **92**
14. Interquartile Range   **6**
15. List Quartile boundaries and any outliers   **72 100 98**

Buy and Sell a Car

Using Statistics to Make Decisions Quiz 2

Name _____

1. Carol has taken 5 tests in this class, this quarter. She wants to finish the class with an average of 92%. What score will she need to have on the last test if her scores were 92, 82, 99, 79, 89? Show your work.

2. Create an original set of 7 numbers with the mean 33. Show your work.

3. Find the value of x that will make the mean of the following data set equal to 60. Show your work.

   52, 45, 79. 80, x

4. The following scores are written in descending order: z, y, x, w, v, u, t, s, r, q, p, o, n. What measure of central tendency does score ***t*** represent?

5. What is the best measure of tendency to use to get a reasonable cost of an item for which you have 8 quotes?

6. Use Craig's List, Auto Trader.com, or any other listing site and find 5-7 listings for a vehicle that is consistent. For example, sedan, 4-door, Model year 1999-2004, mileage under 150,000. Find the mean, median, mode for the data and choose the one you would like to purchase. Make sure to explain why you chose that car and back it up with data.

Buy and Sell a Car

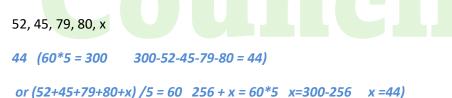**Using Statistics to Make Decisions Quiz 2**

Name _____

1. Carol has taken 5 tests in this class, this quarter. She wants to finish the class with an average of 90%. What score will she need to have on the last test if her scores were 92, 82, 99, 79, 89? Show your work. *99 (90*6=540 92+82+99+79+89 = 441 the difference is 99*

   Or (92+82+99+79+89 + x) /6 =90 441+x=90 * 6 x = 540 -441 x = 99)

2. Create an original set of 7 numbers with the mean 33. Show your work. *Answers will vary but must show work to prove answer.*

3. Find the value of x that will make the mean of the following data set equal to 60. Show your work.

   52, 45, 79, 80, x

   44 (60*5 = 300 300-52-45-79-80 = 44)

   or (52+45+79+80+x) /5 = 60 256 + x = 60*5 x=300-256 x =44)

4. The following scores are written in descending order: z, y, x, w, v, u, t, s, r, q, p, o, n. What measure of central tendency does score ***t*** represent? *The median*

5. What is the best measure of tendency to use to get a reasonable cost of an item for which you have 8 quotes? *The median*

Washington Applied Math Council

https://wa-appliedmath.org/

6. Use Craig's List, Auto Trader.com, or any other listing site and find 5-7 listings for a vehicle that is consistent. For example, sedan, 4-door, Model year 1999-2004, mileage under 150,000. Find the mean, median, mode for the data and choose the one you would like to purchase. Make sure to explain why you chose that car and back it up with data.

Answers will vary but should include all data and show calculations and reasoning.

Chapter 5 Automobile Ownership

Very good explanation with examples of how to find mean, median, mode,
http://www.mathsteacher.com.au/year8/ch17_stat/02_mean/mean.htm

http://www.purplemath.com/modules/meanmode.htm

Another good site for examples of mean, median, mode

http://www.alcula.com/calculators/statistics/quartiles/

Allows you to enter data and have it calculate the quartiles. Also has a good definition of quartiles and the formulas used to calculate them.