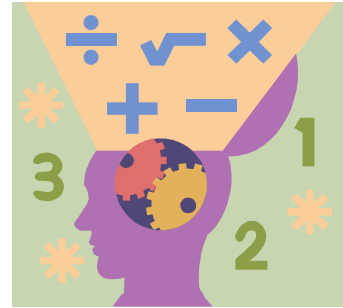


Algebra/Geometry Institute Summer 2009

Faculty Name: Louise Robinson

School: John F. Kennedy Memorial High

Grade Level: 8th



1. Teaching objective(s):

Mississippi Mathematics Framework -

5. Interpret, organize and make predictions about a variety of data using concepts of probability:

C. Find and interpret basic statistical measures- mean, median and mode.

2. Instructional Activities

A. Discussion

The teacher will say to the class, “Today we will define and calculate mean, median and mode.”

The teacher will have students find each quotient of a given set of numbers (Attachment #1 - Overhead Transparency) and will time the students as they work for the answers:

$$(22 + 31 + 28 + 34 + 30) / 5 = (29)$$

$$(10 + 18 + 13 + 16 + 13) / 4 = (14)$$

$$(102 + 113 + 97 + 110) / 4 = (105.5)$$

$$(7 + 9 + 8 + 4 + 8 + 9 + 11 + 8) / 8 = (8)$$

The teacher will ask the students to generate some data on their own. They can choose any numbers they want, but they have to use at least five numbers. The students will be given ten minutes to generate this data and find the quotient as above (dividing the sum of the numbers by the number of addends.) Students will work in groups of three. Each student will check the others work.

B. Examples of Median, Mean, Mode

The teacher will use the following situation to launch a general discussion of the uses of statistics.

The Chocolate City Movie Theater kept a record of how many tickets were sold each day for a week: Monday = 76, Tuesday = 204, Wednesday = 367, Thursday = 385, Friday = 427, Saturday = 436, and Sunday = 372.

The teacher will ask, “If you had to use one number to describe the number of tickets sold on any one day, what would it be?” The teacher will encourage the students to explain their method of finding the answers. Discuss why it’s useful to describe an entire set of data by using one number.

The teacher will explain that when a group of numbers is added and the resulting sum is divided by the number of addends the quotient is called the mean (or average) of that set of data. Each student will find the mean for the movie ticket sales for the week and will compare their answers with others in their group.

The teacher will explain that when data is listed sequentially, the median is the midpoint. Half the data is above and half is below this point. The median need not itself belong to the original set. The students will list the ticket sales sequentially and find the median. The students will examine the other data sets used today and look for the median in each.

The teacher will explain that the mode is the number that occurs most frequently. The teacher will point out that not all data sets have a mode.

Have students suggest applications of mean, median and mode. (The mean would be the class average. Median would be the middle score for the class if all the scores were listed in order. Given a set of test scores, the mode would be the number that was scored most often.)

The teacher will write the following set of data on the chalk board (Attachment #2) and ask the students to explain the difference between median and mean. 20, 20 22, 28, 80

The teacher will tell the students, for this set, the median is 22 but the mean is 34. Ask: Which is the better indicator of the trend?

The teacher will point out that because median and mean are computed differently, they should be interpreted differently. If these data represented test scores, then the median would be a more appropriate measure because an average score that only one person scored higher than would not be very informative. If, however, these data represented the number of cans collected on a recycling drive, then the “average per person” measure of the mean would be quite useful.

The students will complete a worksheet on mean, median and mode.

3. Materials and Resources

Mathematics for Elementary Teachers. Gary L. Musser, William F. Burger 1944,
Prentice Hall, Inc, A Simon & Schuster Company

Basic Knowledge and Modern Technology Revised

Thomas Nelson, Inc. Publishers

1984, 1987, 1989

Elvin Abeles, Calvin D. Linton

Edward H. Litchfield

Chalkboard

Chalk

Paper

Pencil

Mean, Median and Mode Activity Sheet

4. Assessment

Teacher observation

Student assessment (Attachment #3)

Attachment #1

1. $(22 + 31 + 28 + 34 + 30) / 5 =$

2. $(10 + 18 + 13 + 16 + 13) / 5 =$

3. $(102 + 113 + 97 + 110) / 4 =$

4. $(7 + 9 + 8 + 4 + 8 + 9 + 11 + 8) / 8 =$

Answers:

1. 29

2. 14

3. 105.5

4. 8

Attachment #2

Find the median and the mean for the following set of data:

20, 20, 22, 28, 80

The median is the number in the middle, which is 22.

The mean is the average of all five numbers when you add them together and divide by five. The mean is 34.

Median, Mode, & Mean Attachment #3

For each set of data find the median, mode and mean. You may use your calculator.

Set of data	Median	Mode	Mean
78, 96, 83, 78, 94	1.	2.	3.
132, 248, 366, 418, 253, 372	4.	5.	6.
5,697; 5,432; 5,574; 5,459; 5,357 5,495; 5,697; 5,459	7.	8.	9.
0.5, 0.8, 0.6, 1.1, 0.8, 0.1, 0.5	10.	11.	12.
1.12, 2.37, 3.46, 1.29, 2.87, 3.46	13.	14.	15.
4.002, 4.215, 3.84, 4.215, 3.906, 3.84,3.002,4.215	16.	17.	18.
6, 3 $\frac{1}{2}$, 4 $\frac{3}{4}$, 5 $\frac{1}{4}$, 5, 4 $\frac{1}{2}$, 4 $\frac{3}{4}$, 4 $\frac{3}{4}$	19.	20.	21.
7 $\frac{2}{3}$, 6 $\frac{1}{2}$, 4, 5 $\frac{1}{3}$, 8, 7 $\frac{1}{2}$	22.	23.	24.
7 ft 5 in, 12 ft 3 in, 7 ft 9 in, 6 ft 5 in, 10 ft 6 in, 7 ft,9 in	25.	26.	27.
3 lb 8 oz, 2 lb 15 oz, 4 lb 3 oz, 3 lb 10 oz	28.	29.	30.

Median, Mode, & Mean Attachment #3 (Answer Key)

For each set of data find the median, mode and mean. You may use your calculator.

Set of data	Median	Mode	Mean
78, 96, 83, 78, 94	1. 83	2. 78	3. 85.8
132, 248, 366, 418, 253, 372	4. 309	5. no mode	6. 298.167
5,697; 5,432;5,574; 5,459; 5,357 5,495; 5,697; 5,459	7. 5.477	8. 5,459 and 5.697	9. 5,521.25
0.5, 0.8, 0.6, 1.1,0.9, 0.1,0.5	10. 0.6	11. 0.5	12. 0.643
1.12, 2.37, 3.46, 1.29, 2.67, 3.46	13. 2.52	14. 3.46	15. 2.395
4.002, 4.215, 3.84, 4.215, 3.906, 3.84, 3.002, 4.215	16. 3.954	17. 4.215	18. 3.904
6, 3 ½, 4 ¾, 5 ¼,5, 4 ½, 4 ¾ , 4 ¾	19. 4 ¾	20. 4 ¾	21. 4 13/16 or 4.813
7 2/3, 6 1/2 , 4, 5 1/3, 8, 7 1/2	22. 7	23. no mode	24. 6 ½ or 6.5
7 ft 5 in. 12 ft 3 in, 7 ft 9 in 6 ft 5 in, 10 ft 6 in, 7 ft 9 in	25. 7 ft 9 in	26. 7 ft 9 in	27. 8 ft 8 1/6 in
3 lb 8 oz, 2 lb 15 oz, 4 lb 3 oz, 3 lb, 4 lb 5 oz, 2 lb 8 oz, 3 lb 10 oz	28. 3 lb 8 oz	29. no mode	30. 3lb 7 oz