

SALES LEADER

Performance Standard 10A.H

Examine a set of data for three realtors' sales to determine which one is the sales leader accordingly:

- *Mathematical knowledge:* Calculate the mean, median and mode for a data set; know how to manipulate data to represent different points of view.
- *Strategic knowledge:* Present a case for one realtor being the best choice for sales leader based on analysis of the data.
- *Explanation:* Explain completely and clearly what was done and why it was done.

Procedures

1. ***In order to organize, describe and make predictions from existing data (10A)***, students should experience sufficient learning opportunities to develop the following:
 - Determine the best measure of central tendency from mean, median and mode.
 - Discuss how data can be manipulated to represent different points of view based on the use of different measures of central tendency and based on different graphical displays.
2. Provide each student a copy of the "Sales Leader" task sheets and the rubric. Have students review and discuss the task to be completed and how the rubric will be used to evaluate it. Non-graphing calculators are allowed. Use additional paper as needed. Students will have 2 class periods to complete the task.
3. Have the students work individually to solve the problem. (Do not help the students or guide their thinking as they solve the following problem.) All work should be completed in class.

Three realtors work for the same company. Each is being considered for sales leader of the year. The sales leader of the year is given a \$5000 bonus, so each one is trying hard to make the case to be the person selected, based on a year's sales data.
4. Evaluate each student's work using the rubric and its guide to determine the performance level. Give each student a score in each of the three categories, scoring each part of the problem separately. Students receiving a 4 should be able to look at the situation in several ways. For example, they will consider different statistical representations of central tendency, as well as total sales, and distribution of the sales. A score of 3 will generally focus on fewer measures of central tendency, such as mean or median, and will probably not consider all the relevant data, such as total sales or number of sales made. A score of 2 will focus on only one measure of central tendency, and few other details, generally having trouble viewing the data from multiple perspectives. A score of 1 reflects an inability for students to look past one measure of central tendency and an inability to view complex information from more than one point of view. Minor errors in computation include making errors in the actual addition or multiplication, rounding incorrectly. Major errors include using the wrong operation or formulas. Evaluate each part as follows:
 - Part A: The students should describe how each realtor could be viewed as the sales leader. The first realtor had a mean selling price for 48 houses of \$180,000, a median of \$170,000 and a mode of \$190,000. The second realtor had a mean selling price for 63 houses of \$136,825, a median of \$135,000 and a mode of \$145,000. The third realtor had a mean selling price for 48 houses of \$174,583, a median of \$175,000 and a mode of \$175,000.
 - Part B: The students should present a case for one of the realtors and justify it in terms of the sales figures. Students may choose to make a case in terms of quartile range, total dollar sales, highest average selling price, etc. There is not a single correct answer for this part. The key is to be able to produce a convincing argument for the position the student takes.

Examples of Student Work follow

Resources

- Copies of the "Sales Leader" task sheets
- Calculators
- Mathematics Rubric

Time Requirements

- Two class periods

NAME _____ DATE _____

SALES LEADER

Three realtors work for the same company. Each is being considered for sales leader of the year. The sales leader of the year is given a \$5000 bonus; so each of the individuals is trying hard to make the case to be the person selected, based on sales data. The chart provided on the next page shows the value of each home sold during the year by each realtor.

A. Discuss how each person might make a case for being the sales leader, based on the data provided. Be sure to include a comparison of measures of central tendency for each realtor as part of your analysis.

B. Which person do you think should be declared the sales leader, and why?

**SALES LEADER
Data Sheet**

Sales Month	Selling price of homes sold in thousands of dollars		
	Realtor #1	Realtor #2	Realtor #3
January	90, 125, 200	80, 90, 100, 130, 140, 155	125, 145, 225, 255
February	150, 225, 575	75, 95, 105, 115, 130, 150	145, 160, 195
March	130, 175, 205, 215	85, 120, 125, 130, 140	120, 145, 190, 200
April	125, 155, 180, 300	80, 145, 160, 180, 220,	125, 140, 160, 175, 175, 190
May	125, 140, 160, 175, 175, 190	100, 110, 120, 165, 170	110, 140, 165, 190, 210
June	125, 145, 225, 255	90, 145, 155, 190, 200	175, 180, 190
July	110, 140, 165, 190, 210	95, 110, 145, 165, 170	115, 140, 175, 195, 225
August	135, 150, 200, 290	100, 115, 125, 145, 170	170, 175, 180, 190,
September	120, 145, 190, 190	110, 125, 135, 150, 165	150, 225, 375
October	115, 140, 175, 195, 225	145, 165, 175, 190, 200	100, 135, 190, 195
November	135, 150, 165, 190	95, 105, 115, 135, 145, 175	140, 150, 165
December	150, 200	100, 125, 145, 190, 195	175, 180, 195, 210

Name _____

Date 4/11/01

The Sales Leader

Three realtors work for the same company. Each is being considered for sales leader of the year. The sales leader of the year is given a \$5000 bonus, so each of the individuals is trying hard to make the case that they should be the person selected, based on their sales data. The chart provided on the next page shows the value of each home sold during the year by each realtor.

R1: realtor 1
R2: realtor 2
R3: realtor 3

Discuss how each person might make a case for being the sales leader, based on the data provided. Be sure to include a comparison of measures of central tendency for each realtor as part of your analysis.

- * Realtor #1: Realtor #1 could make his case out of the fact that he made the most total money because he sold \$8,640,000 worth of houses while R2 sold \$8,520,000 + R3 only sold \$8,380,000 worth of houses. He could also defend himself greatly by the average price per house he sold. His average price is highest because his average house costed \$180,000 dollars while R2 had \$135,238 + R3 had \$174,583 average.
- * Realtor #2: R2 could use the fact that he sold the highest # of house in his defense. He sold 63 houses while R1 + R3 sold only 48 houses.

B. Which person do you think should be declared the sales leader, and why?

I think that Realtor #1 should be declared sales leader. On average, he had sold \$180,000 houses, higher than anyone else. Also, he had ~~sold~~ made the most money for our company - \$8,640,000!

Since this business is about making money, the one who made the most money - Realtor #3 - should get the \$5,000 bonus

* Realtor #3 - Realtor #3 could use the fact the most houses that he sold were \$190,000. He sold 5 at that price. Realtor #2 only had sold \$145,000 dollar houses most of the time. And even ~~though~~ though R#1 had sold \$190,000 houses most often, he only sold 4.

5:145
11:100
125

4:145
5:190
6:175
7:140

Sales Leader Data Sheet

Sales Month	Selling price of homes sold in thousands of dollars.		
	Realtor #1	Realtor #2	Realtor #3
January	90, 125, 200 415	88, 90, 100, 130, 140, 155 695	126, 145, 225, 255 750
February	150, 225, 575 950	75, 95, 105, 115, 130, 150 670	145, 180, 195 500
March	130, 175, 205, 215 725	85, 120, 125, 130, 140 600	120, 145, 190, 200 650
April	125, 155, 180, 300 760	80, 145, 160, 180, 220, 705	125, 140, 160, 175, 175, 190 65
May	125, 140, 160, 175, 175, 190 965	100, 110, 120, 165, 170 665	110, 140, 165, 190, 210 815
June	125, 145, 225, 255 750	90, 145, 155, 190, 280 660	175, 180, 190 545
July	110, 140, 165, 190, 210 815	95, 110, 145, 165, 170 685	115, 140, 175, 195, 225 850
August	135, 150, 200, 290 775	100, 115, 125, 145, 170 659	170, 175, 180, 190 75
September	120, 145, 190, 190 645	110, 125, 135, 150, 165 665	150, 225, 375 750
October	115, 140, 175, 195, 225 850	145, 165, 175, 190, 200 87	100, 135, 190, 195 620
November	135, 150, 165, 190 640	95, 165, 145, 195, 145, 175 70	140, 150, 165 455
December	150, 200 350	100, 125, 145, 190, 195 75	175, 180, 195, 210 760

9:120
4:125
4:190
3:200

Mean: 180,000

Median: 170

Mode: 150, 175, 190

Total # sold: 48

Total price: 8,640,000

135, 238

145

63

8,510,000

174,583

Mode: 190

48

8,380,000

90, 110, 115, 120, 125, 125, 1, 125, 130, 135, 135, 140, 140, 140, 145, 145, 150, 150, 150, 160

Name _____

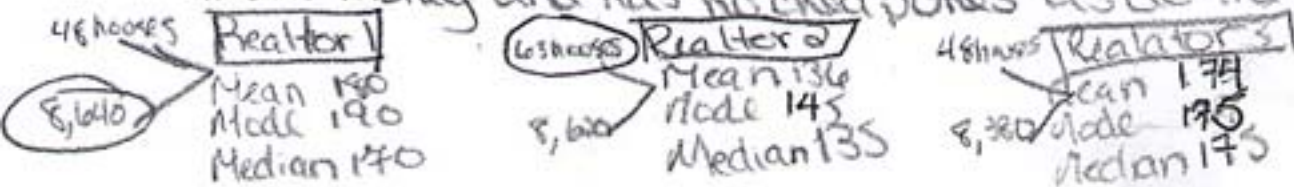
Date 4/17/01

The Sales Leader

Three realtors work for the same company. Each is being considered for sales leader of the year. The sales leader of the year is given a \$5000 bonus, so each of the individuals is trying hard to make the case that they should be the person selected, based on their sales data. The chart provided on the next page shows the value of each home sold during the year by each realtor.

- A. Discuss how each person might make a case for being the sales leader, based on the data provided. Be sure to include a comparison of measures of central tendency for each realtor as part of your analysis.

First I took the chart and found the mean, median, and mode for each. With this data I concluded that number 1 could say he has the most profits since he has \$8,640,000. Also number 2 could go for the most houses sold he has 63 houses. Then number 3 could say he sell an even amount of house in and through the year 24 houses the first half of year and 24 the second half he also could say he sells a house for much more money and has no cheap ones as do the others.



- B. Which person do you think should be declared the sales leader, and why?

I think realtor #2 should be sales leader because even though he made 20 less than #1 in time he will make up for that and more because he sells many more houses than the others. If he keeps this up he can get cheap per houses so he will sell more and while #1 sells 1 house for 150 and #3 sells one for 175 he will sell 3 houses for 90 and get 270 and get almost as much as the 2 combined. He is going to make out a lot better in the end. Real tor #2 should be the sales leader of the year.

Mode = Most
 Median = Middle
 Mean =

Sales Leader Data Sheet

Sales Month	Selling price of homes sold in thousands of dollars.		
	Realtor #1	Realtor #2	Realtor #3
January	90, 125, 210	80, 90, 160, 130, 140, 155	126, 145, 225, 255
February	190, 225, 375	75, 95, 165, 116, 130, 160	145, 160, 195
March	190, 175, 285, 215	85, 120, 125, 130, 140	190, 145, 190, 280
April	125, 155, 180, 300	80, 145, 160, 180, 220	126, 140, 160, 175, 175, 190
May	125, 140, 160, 175, 175, 190	100, 110, 120, 165, 170	110, 140, 165, 160, 210
June	125, 145, 225, 255	90, 145, 155, 190, 280	175, 180, 190
July	110, 140, 165, 190, 210	95, 110, 145, 165, 170	115, 140, 175, 195, 225
August	135, 150, 280, 290	100, 115, 125, 145, 170	170, 175, 180, 190
September	120, 145, 190, 190	110, 125, 135, 160, 165	160, 225, 375
October	115, 140, 175, 195, 225	145, 165, 175, 190, 200	180, 136, 190, 195
November	135, 160, 165, 190	95, 105, 145, 135, 145, 175	140, 150, 165
December	150, 200	100, 125, 145, 190, 195	175, 180, 195, 210

8,640 40 hours 8,620 63 hours 46 hours 8,380

Mean = 180
 Mode = 190
 Median = 170

Most income

Mean = 136
 Mode = 145
 Median = 135

Most hours

Mean = 174
 Mode = 175
 Median = 175

Sell same