

## AGRICULTURAL EQUIPMENT SALES LEADER

### Performance Standard 10A.H

Examine a set of data for sales made by three agricultural equipment salespersons 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 salesperson 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.

Students desiring employment in agriculture related occupations need to be able to work with mean, median and mode for many reasons: those wanting to be agricultural business managers will calculate mean, median and mode when evaluating employees; those wanting to be agricultural sales representatives of any agricultural product will calculate their own productivity using mean, median and mode; and those wanting to own or operate crop or livestock businesses need to be able to calculate the profit for the enterprise to determine if the enterprise should be changed or discontinued.
2. Provide each student a copy of the "Agricultural Equipment 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.
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 agricultural equipment salespersons work for the same company. Each is being considered for sales leader of the year. The sales leader of the year is given a \$3,000 bonus. Therefore, each one is trying hard to make the case to be the person selected, based on a year's sales data for all sales over \$10,000.
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 or rounding incorrectly. Major errors include using the wrong operation or formulas. Evaluate each part as follows:
  - Part A: The students should describe how each salesperson could be viewed as the sales leader. The first salesperson had a mean selling price for 48 sales of equipment of \$85,500, a median of \$50,500 and a mode of \$50,000. The second had a mean selling price for 63 sales of equipment of \$75,980, a median of \$65,000 and a mode of \$45,000. The third had a mean selling price for 50 sales of equipment of \$67,980, a median of \$60,000 and a mode of \$75,000.
  - Part B: The students should present a case for one of the sales people 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**

- [Meets](#)
- [Exceeds](#)

**Time Requirements**

- Two class periods

**Resources**

- Copies of the "Agricultural Equipment Sales Leader" task sheets
- Non-graphing calculators
- Mathematics Rubric

NAME \_\_\_\_\_ DATE \_\_\_\_\_

## AGRICULTURAL EQUIPMENT SALES LEADER

### Student Task Sheet

Three agricultural equipment salespersons work for the same company. Each is being considered for sales leader of the year. The sales leader of the year is given a \$3,000 bonus. Therefore, each of the individuals is trying hard to make the case to be the person selected, based on a year's sales data. The chart provided on the next page shows the value of each sale above \$10,000 during the year by each salesperson.

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 agricultural equipment salesperson as part of your analysis.

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

**SALES LEADER  
Data Sheet**

<b>Sales Month</b>	<b>Selling price of agricultural equipment sold in thousands of dollars</b>		
	<b>Salesperson #1</b>	<b>Salesperson #2</b>	<b>Salesperson #3</b>
January	15, 75, 90	80, 90, 50, 11, 30, 55	15, 45, 27, 89
February	50, 15, 70	75, 95, 105, 82, 19, 50	45, 60, 65
March	30, 75, 203, 197	85, 20, 25, 130, 143	18, 45, 90 21
April	25, 55, 80, 125	80, 45, 60, 82, 29	25, 60, 42, 75, 172, 161
May	25, 40, 62, 175, 168, 45	105, 31, 13, 65, 72	23, 40, 94, 90, 210
June	45, 15, 221, 211	91, 45, 155, 190, 200	75, 80, 19
July	13, 40, 16, 19, 210	15, 11, 45, 35, 170	11, 14, 17, 19, 225
August	35, 50, 29, 214	52, 15, 25, 145, 172	70, 75, 83, 195,
September	45, 24, 137, 191	110, 25, 35, 56, 165	53, 25, 37, 89
October	25, 75, 43, 195, 223	65, 45, 75, 93, 206	35, 15, 90, 68
November	35, 62, 51, 190	15, 55, 115, 135, 45, 77	12, 50, 85, 66
December	50, 20	14, 25, 45, 98, 195	75, 80, 95, 210

## MATHEMATICS RUBRIC

NAME \_\_\_\_\_ DATE \_\_\_\_\_

- Exceeds standard (must receive a 4 in each area)
- Meets standard (must receive all 3's or a combination of 3's and 4's)
- Approaches standard (must receive all 2's or any combination which may include a 3 or a 4)
- Begins standard (has no 3's or 4's but not all 1's)
- Absent (has all 1's and 0's)

	<b>Mathematical Knowledge</b>	<b>Strategic Knowledge</b>	<b>Explanation</b>
<b>4</b>	<ul style="list-style-type: none"> <li>• Wrote the right answer.</li> <li>• Used math words correctly to show understanding of how math works.</li> <li>• Worked it out with no mistakes.</li> <li>• Used the right math words and labeled the answers.</li> </ul>	<ul style="list-style-type: none"> <li>• Identified all the important parts of the problem, and knew how they went together.</li> <li>• Showed all the steps used to solve the problem.</li> </ul>	<ul style="list-style-type: none"> <li>• Wrote what was done and why it was done.</li> <li>• If a drawing was used, all of it was explained in writing.</li> </ul>
<b>3</b>	<ul style="list-style-type: none"> <li>• Knew how to do the problem, but made small mistakes.</li> </ul>	<ul style="list-style-type: none"> <li>• Identified most of the important parts of the problem.</li> <li>• Showed most of the steps used to solve the problem.</li> </ul>	<ul style="list-style-type: none"> <li>• Wrote mostly about what was done.</li> <li>• Wrote a little about why it was done.</li> <li>• If a drawing was used most of it was explained in writing.</li> </ul>
<b>2</b>	<ul style="list-style-type: none"> <li>• Understood a little, but made a lot of big mistakes.</li> </ul>	<ul style="list-style-type: none"> <li>• Identified some of the important parts of the problem.</li> <li>• Showed some of the steps used to solve the problem.</li> </ul>	<ul style="list-style-type: none"> <li>• Wrote some about what was done or why it was done but not both.</li> <li>• If a drawing was used, some of it was explained in writing.</li> </ul>
<b>1</b>	<ul style="list-style-type: none"> <li>• Tried to do the problem, but didn't understand it.</li> </ul>	<ul style="list-style-type: none"> <li>• Identified almost no important parts of the problem.</li> <li>• Showed almost none of the steps used to solve the problem.</li> </ul>	<ul style="list-style-type: none"> <li>• Wrote or drew something that didn't go with the answer.</li> <li>• Wrote an answer that was not clear.</li> </ul>
<b>0</b>	<ul style="list-style-type: none"> <li>• No answer attempted.</li> </ul>	<ul style="list-style-type: none"> <li>• No strategy shown.</li> </ul>	<ul style="list-style-type: none"> <li>• No written explanation.</li> </ul>
<b>Score</b>			