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DepED
DEPARTMENT OF EDUCATION

Lesson Exemplar for Mathematics

Quarter 4
Lesson
1

Lesson Exemplar for Mathematics Grade 8
Quarter 4: Lesson 1 (Week 1)
SY 2025-2026

Development Team

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MATHEMATICS / QUARTER 4 / GRADE 8

I. CURRICULUM CONTENT, STANDARDS, AND LESSON COMPETENCIES	
A. Content Standards	The learners demonstrate knowledge and understanding of measures of variability for ungrouped data.
B. Performance Standards	By the end of the quarter, the learners are able to calculate measures of variability for ungrouped data.
C. Learning Competencies and Objectives	***Learning Competencies*** The learners calculate the measures of variability (range, mean deviation, variance and standard deviation) for ungrouped data. ***Learning Objectives*** By the end of the lesson, the learners are expected to: 1. calculate the range of ungrouped data; 2. calculate the mean deviation of ungrouped data; and 3. calculate the variance and standard deviation of ungrouped data.
D. Content	**Measures of Variability of Ungrouped Data**
E. Integration	None

II. LEARNING RESOURCES
Admin. (2022, October 10). Variance and Standard Deviation-Definition, Formula, Relation and Example. BYJUS. https://byjus.com/maths/variance-and-standard-deviation/ Daniel Storage. (2019, June 18). Measures of variability (Range, standard deviation, variance) [Video]. YouTube. https://www.youtube.com/watch?v=s7WTQ0H0Acc Prof D. (2021, May 16). Range, mean deviation, variance, and standard deviation for ungrouped data | Measures of Variation [Video]. YouTube. https://www.youtube.com/watch?v=xUU_L7Ob054

<table>
<tr><th colspan="2">III. TEACHING AND LEARNING PROCEDURE</th><th>NOTES TO TEACHERS</th></tr>
<tr><td>A. Activating Prior Knowledge</td><td>
DAY 1
1. Short Review
Let the learners analyze and solve the problem below.

Activity 1: Do You Remember?
The scores of 9 students in a 100-item test are 67, 70, 49, 95, 40, 97, 62, 54, and 42. Calculate the mean, median and mode.

2. Feedback (Optional)
</td><td>
This activity is intended to recall the measures of central tendency.

Answer Key:
mean = 64
median= 62
mode = none
</td></tr>
<tr><td>B. Establishing Lesson Purpose</td><td>
1. Lesson Purpose
Let the learners analyze the situation below and answer the question that follows.

Activity 2: Which is Which?
A teacher randomly selected 5 students from Class A and another 5 students from Class B to take a 100-item examination. The results are as follows:
<table>
<tr><th>Class</th><th>Scores</th><th>Mean</th><th>Standard Deviation</th></tr>
<tr><td>A</td><td>80, 85, 85, 90, 95</td><td>87</td><td>5.70</td></tr>
<tr><td>B</td><td>65, 80, 95, 95, 100</td><td>87</td><td>14.40</td></tr>
</table>
Guide Questions:
1. What do you notice with the mean score of Class A and B?
2. What do you notice with the standard deviation of Class A and B?
3. If you were to decide which class performed better, who will it be and why?

2. Unlocking Content Vocabulary
• Measures of Variability or Measures of Dispersion refer to the spread of the values about the mean.
• Range is simply the difference of the highest value and the lowest value.
• Mean Deviation is a measure of variation that makes use of all the scores in a distribution. It is used to calculate the how close to the mean your values are.
• Variance is a measure of how data points vary from the mean.
• Standard Deviation is the average of how far the scores are from the mean.
</td><td>
Activity 2 is intended to give the learners an idea of what measure of variability is particularly standard deviation.

You may also add other questions if necessary.

Answer Key:
1. They are the same.
2. The SD of Class A is lower than Class B.
3. Class A performed better since their scores are less disperse which was supported by the computed SD.
</td></tr>
</table>

C. Developing and Deepening Understanding	**DAY 2-3** **1. Explicitation** a. In computing the **range**, we use the formula $$\boldsymbol{R = H - L}$$ *where*: H = *highest value* L = *lowest value* b. In computing the **mean deviation**, we use the formula: $$\boldsymbol{M.D = \frac{\sum|x - \bar{x}|}{N}}$$ *where*: x = *individual score* $\bar{x}$ = *mean* $\bar{N}$ = *number of scores* c. In computing the **variance**, we use the formula: $$\boldsymbol{S^2 = \frac{\sum(x - \bar{x})^2}{N - 1}}$$ *where*: x = *individual score* $\bar{x}$ = *mean* $\bar{N}$ = *number of scores* d. In computing the **standard deviation**, we use the formula: $$\boldsymbol{S = \sqrt{\frac{\sum(x - \bar{x})^2}{N - 1}}}$$ *where*: x = *individual score* $\bar{x}$ = *mean* $\bar{N}$ = *number of scores* Note: Standard deviation is simply the square root of variance.	

2. Worked Example

Example 1: From Activity 2, the scores of the randomly selected students in Class B are 65, 80, 95, 95, 100. Compute for the range.

Solution: The highest value from the given is 100 while the lowest value is 65, hence:

$$R = H - L$$
$$R = 100 - 65$$
$$R = 35$$

Thus, the range is **35**.

Example 2: From Activity 2, the scores of the randomly selected students in Class A are 80, 85, 85, 90, 95. Compute for the mean deviation.

Solution: First let's create a table and arrange the given scores

x	$x - \bar{x}$	$\lvert x - \bar{x} \rvert$
80		
85		
85		
90		
95		

To complete the needed data for the table, we need to first compute for the mean:

$$\bar{x} = \frac{80 + 85 + 85 + 90 + 95}{5} = 87$$

Then, to complete the column of $x - \bar{x}$, we will subtract each score by the mean. For the last column, we only need to get the absolute value of each number in the second column.

x	$x - \bar{x}$	$\lvert x - \bar{x} \rvert$
80	-7	7
85	-2	2
85	-2	2
90	3	3
95	8	8

You may add more examples if needed.

After completing the table, next is to find the $\sum|x-\bar{x}|$ or the sum of all the values in the last column.

x	$x-\bar{x}$	$\lvert x-\bar{x}\rvert$
80	-7	7
85	-2	2
85	-2	2
90	3	3
95	8	8

$$\sum|x-\bar{x}| = 22$$

Now, we can use the formula for solving mean deviation,

$$M.D = \frac{\sum|x-\bar{x}|}{N}$$

$$= \frac{22}{5}$$

$$M.D. = 4.4$$

Thus, the mean deviation is **4.4**.

Example 3: Calculate the variance and standard deviation of the grades of 10 students in Mathematics 8: 90, 73, 78, 79, 83, 95, 77, 79, 74, 82.

Solution: First let's create a table and arrange the given scores

x	$x-\bar{x}$	$(x-\bar{x})^2$
90		
73		
78		
79		
83		
95		
77		
79		
74		
82		

To complete the needed data for the table, we need to first compute for the mean:

$$\bar{x} = \frac{90 + 73 + 78 + 79 + 83 + 95 + 77 + 79 + 74 + 82}{10} = 81$$

Then, to complete the column of $x - \bar{x}$, we will subtract each score by the mean. For the last column, we only need to get the square of each number in the second column.

x	$x - \bar{x}$	$(x - \bar{x})^2$
90	9	81
73	-8	64
78	-3	9
79	-2	4
83	2	4
95	14	196
77	-4	16
79	-2	4
74	-7	49
82	1	1

After completing the table, next is to find the $\sum(x - \bar{x})^2$ or the sum of all the values in the last column.

x	$x - \bar{x}$	$(x - \bar{x})^2$
90	9	81
73	-8	64
78	-3	9
79	-2	4
83	2	4
95	14	196
77	-4	16
79	-2	4
74	-7	49
82	1	1

$$\sum(x - \bar{x})^2 = 428$$

Now, we can use the formula for solving the variance,

$$S^2 = \frac{\sum(x - \bar{x})^2}{N - 1}$$

$$S^2 = \frac{428}{10 - 1}$$

$$= \frac{428}{10 - 1}$$

$$S^2 = 47.56$$

Remember that the standard deviation is the square root of the variance, so

$$S = \sqrt{47.56}$$

$$S = 6.90$$

Thus, the variance is **47.56** and the standard deviation is **6.90**.

3. Lesson Activity

Activity 3: Try This!

Instruction: Let the learners analyze and solve the problem.

1. The number of building permits issued by your municipality last month were 4, 7, 0, 11, 4, 1, 15, 3, 5, 8, and 7. Find the:
   a. range
   b. mean deviation
   c. variance
   d. standard deviation

2. The number of incorrect answers on a true-or-false test of your 15 classmates were recorded by your teachers as follows: 2, 1, 3, 0, 1, 3, 0, 0, 3, 3, 5, 2, 1, 4 and 2. Find the
   a. range
   b. mean deviation
   c. variance
   d. standard deviation

Provide enough time for the learners to accomplish this activity.

You may adjust the indicated time in the worksheet for this activity if necessary.

Answer Key:

1. a. 15
   b. 3.36
   c. 19.1
   d. 4.37

2. a. 2
   b. 1.2
   c. 2.29
   d. 1.51

D. Making Generalizations	**DAY 4** **Learners' Takeaways and Reflection on Learning** **Activity 4: Closing the Loop!** Instruction: Let the learners answer the following questions. 1. What are the key concepts of our lesson? 2. Which part of the lesson is the easiest for you? Why? 3. Which part of the lesson is the hardest for you? Why? 4. How are we as a class today?	The activity is intended to determine what the learners have learned as well as to give feedback to their experiences during the lesson. Allot enough time to listen and process the responses of your learners. You may also add questions if needed.

IV. EVALUATING LEARNING: FORMATIVE ASSESSMENT AND TEACHER'S REFLECTION		**NOTES TO TEACHERS**
A. Evaluating Learning	**1. Formative Assessment** **Activity 5: Let's Solve It!** Instruction: Let the learners analyze and answer the question that follows. According to PAG-ASA, last April 30, 2023, the heat index recorded in their 14 monitoring stations are the following:	**Answer Key:** range= 16 M.D.= 3.14 variance = 18.89 standard dev. = 4.35

Station	Heat Index (Celsius)
Aparri, Cagayan	41
Baguio, Benguet	28
Baler, Aurora	42
Basco, Batanes	34
Borongan, Eastern Samar	38
Butuan City, Agusan Del Norte	41
Calapan, Orriental Mindoro	40
Catarman, Northern Samar	44
Clark Airport, Pampanga	43
Coron, Palawan	36
Cubi Pt., Subic Bay Olongapo City	41
Daet, Camarines Norte	40
Dagupan City, Pangasinan	44
Davao City, Davao Del Sur	41

Source: https://mindanews.com/top-stories/2023/05/davao-city-posts-highest-heat-index-in-mindanao-on-april-29-and-30/#gsc.tab=0

Compute for the range, mean deviation, variance and standard deviation.

<table>
<tr><td></td><td colspan="3">2. Homework (Optional)</td><td></td></tr>
<tr><td rowspan="5">B. Teacher's Remarks</td><td>Note observations on any of the following areas:</td><td>Effective Practices</td><td>Problems Encountered</td><td rowspan="5">The teacher may take note of some observations related to the effective practices and problems encountered after utilizing the different strategies, materials used, learner engagement, and other related stuff.

Teachers may also suggest ways to improve the different activities explored/lesson exemplar.</td></tr>
<tr><td>strategies explored</td><td></td><td></td></tr>
<tr><td>materials used</td><td></td><td></td></tr>
<tr><td>learner engagement/ interaction</td><td></td><td></td></tr>
<tr><td>others</td><td></td><td></td></tr>
<tr><td>C. Teacher's Reflection</td><td colspan="3">Reflection guide or prompt can be on:
• <u>principles behind the teaching</u>
What principles and beliefs informed my lesson?
Why did I teach the lesson the way I did?

• <u>students</u>
What roles did my students play in my lesson?
What did my students learn? How did they learn?

• <u>ways forward</u>
What could I have done differently?
What can I explore in the next lesson?</td><td>Teacher's reflection in every lesson conducted/facilitated is essential and necessary to improve practice. You may also consider this as an input for the LAC/Collab sessions.</td></tr>
</table>