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DEPARTMENT OF EDUCATION

Lesson Exemplar for Mathematics

Quarter 3
Lesson
2

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Lesson Exemplar for Mathematics Grade 7
Quarter 3: Lesson 2 (Week 2)
SY 2024-2025

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MATHEMATICS / QUARTER 3 / GRADE 7

I. CURRICULUM CONTENT, STANDARDS, AND LESSON COMPETENCIES	
A. Content Standards	The learners should have knowledge and understanding of … 1. data collection and sampling techniques, and the presentation of data in appropriate tables and graphs. 2. interpretation of statistical graphs.
B. Performance Standards	By the end of the lesson, the learners are able to … • collect data and organize data in a frequency distribution table. (DP) • represent and interpret data in different types of graphs. (DP)
C. Learning Competencies and Objectives	By the end of the lesson, the learners … **Organize statistical data in a frequency distribution table.** 1. Correctly identify and describe a frequency distribution table. 2. Correctly organize data using a frequency distribution table. **Use appropriate graphs to represent organized data: pie graph, bar graph, line graph, histogram and stem-and-leaf plot.** 1. Correctly use different graphs for their specific purpose. 2. Properly create a graph based on the given data. **Interpret statistical graphs.**
D. Content	• Frequency Distribution Table • Graphical Representation of Data • Interpretation of Statistical Graph
E. Integration	Market Research • Presentation and interpretation of graphs

II. LEARNING RESOURCES
Byju's The Learning App. *Types of Graphs*. Retrieved December 2023 from https://byjus.com/maths/types-of-graphs/ Dummies. (2016). *The Basics of Pie Chart.* Retrieved 19 December 2023 from ummies.com/article/academics-the-arts/math/pre algebra/the-basics-of-pie-charts-168778/ Hoyland, S. Study.com (2023). *Frequency Distribution in Statistics: Table and Examples.* Retrieved 20 December 2023 from https://study.com/learn/lesson/frequency-distribution-table.html Nivera, G. C. (2018). Grade Mathematics: Patterns and Practicalities (pp. 435-436). Don Bosco Press.

Pierce, R. Math is Fun. (2022). *Frequency Distribution.* Retrieved 20 December 2023 from https://www.mathsisfun.com/data/frequency-distribution.html
Pierce, Rod. "Data Graphs (Bar, Line, Dot, Pie, Histogram)" Math Is Fun. Ed. Rod Pierce. 20 Dec 2023. 20 Dec 2023 http://www.mathsisfun.com/data/data-graph.php
StatisticsHowTo.com. (2023). *Frequency Distribution Table*: *Examples, How to Make One* Retrieved 19 December 2023 from https://www.statisticshowto.com/probability-and-statistics/descriptive-statistics/frequency-distribution-table/

III. TEACHING AND LEARNING PROCEDURE		**NOTES TO TEACHERS**
A. Activating Prior Knowledge	**DAY 1** **1. Short Review** Let the students do the activity below. A. Answer the following: 1. What is 20% of 570? 2. What is 25% of 800 3. What is 15% of 5% of 100 B. Solve the following word problems. 1. Mr. Andres receives ₱25,000 in salary per month. If he saves 10% of it, how much does he save per month? 2. Among 320 students in a batch, 10% did not attend their batch party. How many students did not attend? 3. In a garden, there are 6,900 flowers, 40% of which are yellow. Find the number of yellow flowers. **2. Feedback (Optional)**	The teacher will introduce the lesson by giving the learner a short recall on percentages. For short review B, the teacher may employ group work to engage learners in an interactive approach to activate prior knowledge.
B. Establishing Lesson Purpose	**1. Lesson Purpose** Share this survey example with the learner to elaborate on the purpose of the lesson. "Do you feel motivated to present gifts during special events? If so, do you expect to receive anything in return? Do you think giving is preferable to receiving at special events?" Suppose that in a survey on gift giving, 71% of the respondents polled said that it is "better to give" gifts, while 29% said it is "better to receive." This survey shows that statistics has become a helpful tool in many aspects of our lives, such as in medicine, psychology, education, sociology, and other academic areas, to discover ways to improve human lives.	In this part, the teacher will introduce the lesson and discuss its importance to the daily life of the learner.

	2. Unlocking Content Area Vocabulary A **statistical table** is used to organize data and to display it graphically. The **frequency distribution table** is a statistical table that deals with the frequency or number of occurrences of a given variable for a specific experimental unit.	
C. Developing and Deepening Understanding	**SUB-TOPIC 1: Frequency Distribution Table** **1. Explicitation** Suppose you are keeping track of how much money you have saved each week. You are able to save for the last three years or 156 weeks. What do you think is the best method to organize these numbers? To answer the question, you are going to study one of the ways of data collecting and arrangement. This is known as **a frequency distribution table**. In this lesson, you will learn how to organize and describe data in a frequency distribution table correctly. • **Statistical Table** is used to organize the data and can also help us display the data graphically. • The **frequency distribution table** is a sort of statistical table that deals with the frequency or number of occurrences of a given variable for a specific experimental unit. The parts of a simple frequency distribution table are as follows: ● The category column refers to the things being considered. ● The frequency is the number of times each category appears on the data set. ● The relative frequency is the part of measurements compared to the whole sample. To get the relative frequency, divide the frequency of each fruit by the total frequency. Remember that the sum of all relative frequencies must be equal to 1. ● The percentage represents the measurement's portion to the overall sample, expressed in hundreds (%). Likewise, the sum of the percentages must be equal to 100%.	In this sub-topic, the teacher can use the work example as an individual or group activity and as formative assessment to let learners participate in an interactive discussion. Along with the discussion, the teacher may also use the activity sheet as a formative assessment. This lesson proper can also be repeated in sub-topic 2. The teacher may also add more activities for further elaboration of the lesson as the need arises.

Category	Frequency	Relative Frequency	Percentage

Example:

Vegetables	Frequency	Relative Frequency	Percentage
Eggplant	5	0.20	20%
Carrot	4	0.16	16%
Cabbage	3	0.12	12%
Zucchini	6	0.24	24%
Green Peas	4	0.16	16%
Bell Pepper	3	0.12	12%
Total	**25**	**1.00**	**100%**

2. Worked Example

After a survey, Gina gathered data about the fruit preferences of some Grade 7 students. The result is presented in the table below.

Orange	Apple	Banana	Orange	Mango
Mango	Orange	Orange	Banana	Apple
Apple	Banana	Apple	Orange	Orange

a. How many of each fruit are there in the data gathered?
b. Create a frequency distribution table of the data gathered.

Solution:
Step 1. Start by transforming the raw data (ungrouped data) into grouped data by considering the frequency per fruit.
Step 2. Determine the categories.
Based on the raw data, the fruit categories are apple, orange, banana, and mango.
Step 3. Count the frequency per fruit.
The frequency of oranges is 6, apples is 4, mangoes is 2, and bananas is 3. The total frequency is 15, which is the sum of all these frequencies.

Fruit	Frequency	Relative Frequency	Percentage
Orange	6		
Apple	4		
Mango	2		
Banana	3		
Total	**15**		

Step 4. Compute for the relative frequency.
To get the relative frequency of each category, we divide each frequency by 15. The formula is given by:

$Relative\ frequency_{\ category} = \frac{frequency}{total\ frequency}$.

For oranges:

$Relative\ frequency_{\ Orange} = \frac{6}{15 = 0.40}$

For apples:

$Relative\ frequency_{\ apple} = \frac{4}{15\ = 0.27}$

For mangoes:

$Relative\ frequency_{\ mango} = \frac{2}{15 = 0.13}$

For bananas:

$Relative\ frequency_{\ banana} = \frac{3}{15 = 0.20}$

Fruit	Frequency	Relative Frequency	Percentage
Orange	6	0.40	
Apple	4	0.27	
Mango	2	0.13	
Banana	3	0.20	
Total	**15**	**1.00**	

Step 5. Compute for the percentage.
Compute the percentage by multiplying the relative frequency by 100 or just simply move the decimal point two decimal places to the right.

Fruit	Frequency	Relative Frequency	Percentage
Orange	6	0.40	40%
Apple	4	0.27	27%
Mango	2	0.13	13%
Banana	3	0.20	20%
Total	**15**	**1.00**	**100%**

If time permits, the teacher can give the item found on the Formative Assessment under Homework, Item 3.a as a drill exercise. Otherwise, this item can be given as an assignment.

DAY 2

3. Lesson Activity

A. Using the examples above, answer what is being asked in each item.

1. Complete the frequency distribution table below.

Day 2 may start with a discussion of the assignment and a quick review of yesterday's lesson.

Category	Frequency	Relative Frequency	Percentage
Male	45		
Female	37		
Total	82		

2. Create a frequency distribution table with the given data below:

Red	Orange	Yellow	Blue	Red
Violet	Yellow	Orange	Blue	Green
Green	Yellow	Blue	Orange	Blue
Blue	Violet	Violet	Green	Red

B. Group Task: To be done in groups. (15 pts per item)
Directions: Read and analyze the following word problems, then answer the questions that follow. Be guided by the rubric below.

Criteria	Points	Accumulated Points
Accuracy of Solution	7	
Proper use of statistical data and symbols	3	
Total	15	

1) Donna conducted a survey about the preferred Student Government presidents of Grade 7 students from a school. Among the 140 respondents, 15% preferred Lloyd, 20% for Emily, 15% for Anne, 15% for Patricia, 30% for Emmanuel, and the rest for Keith. Help Dona create a frequency distribution table of the data.
2) In a survey for the Outstanding Faculty of the Year, 60 students voted for Ms. Luz, 25 students voted for Mr. Henry, and 35 students voted for Ms. Lina.
   a. What is the total number of students who participated in the survey?
   b. What is the percentage of students who voted for
      i. Ms. Luz;
      ii. Mr. Henry; and
      iii. Ms. Lina?
   c. Create a frequency distribution for the problem.
3) The Supreme Student Government (SSG) conducted a survey about those students who wanted to join the Senior High School Promenade in February. They gathered the following data: 40 will attend, 25 will not attend, and the rest are still undecided.

Then Worksheet Number 1 can be used as an activity to master the lesson.

Discussion of answers in Worksheet Number 1 is expected to be done in Day 2.

a. If there are 135 Senior High School Students, how many are still undecided?
b. What is the percentage of students who will:
   i. attend?
   ii. will not attend?
   iii. not decided?
c. Create a frequency distribution table for the problem.

DAY 3

Day 3 may start with a recap of the lessons in Day 1 and Day 2.

SUB-TOPIC 2: Pie Graph

1. Explicitation

For better visualization of data, graphs can be used for illustration. Pie graph or pie chart is an example of data presentation to illustrate the frequency distribution.

A **pie graph** is a circular graph that shows how the categories are distributed. It shows the division of a whole into its parts. It is used to convey information on different categories, like business, sciences, and education.

To draw a pie graph, assign one sector of a circle to each category. The angle of each sector should be proportional to the relative frequency in that category. Since one full circle has 360°, we can find the angle for each category by multiplying the relative frequency by 360°. Below are examples of pie graphs.

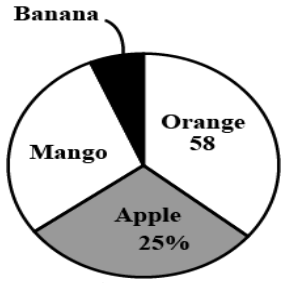


Figure 1

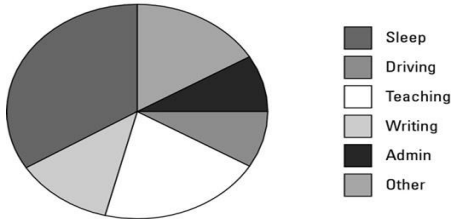


Figure 2

The teacher may show some pie graphs from news clips found on the net.

- In Figure 1, the chart shows the distribution of different kinds of fruits.
- In Figure 2, the breakdown of the 24-hour schedule of a person is shown.

2. Worked Example

Consider the data below. Suppose you have conducted a survey of your friends to find what kind of movie they like and listed down all the responses using the frequency distribution table as shown below.

Favorite Type of Movie				
Action	Comedy	Drama	Romance	SciFi
5	4	6	4	1

Create a pie chart to represent the data.

1) Put your data into a table (like above), then add up all the values to get a total:

Favorite Type of Movie					
Action	Comedy	Drama	Romance	SciFi	**Total**
5	4	6	4	1	**20**

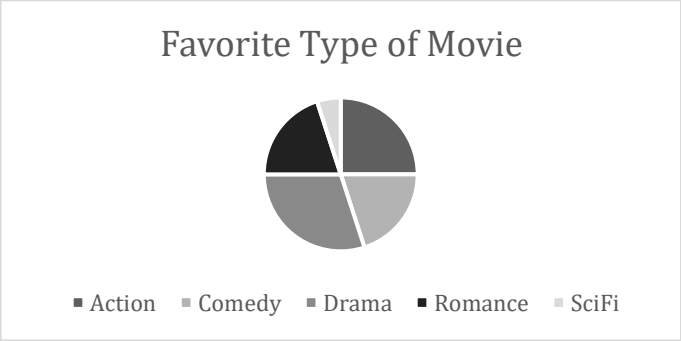
2) Divide each value by the total and multiply by 100 to get the percent.

Favorite Type of Movie					
Action	Comedy	Drama	Romance	SciFi	Total
5	4	6	4	1	20
25%	**20%**	**30%**	**20%**	**5%**	**100%**

3) To find out how many degrees for each sector or "pie slice", multiply each ratio of different movies.

Favorite Type of Movie					
Action	Comedy	Drama	Romance	SciFi	Total
5	4	6	4	1	20
25%	20%	30%	20%	5%	100%
$\frac{5}{20} \times 360^o$	$\frac{4}{20} \times 360^o$	$\frac{6}{20} \times 360^o$	$\frac{4}{20} \times 360^o$	$\frac{1}{20} \times 360^o$	**360^0**
90^0	**72^0**	**108^0**	**720**	**18^0**	

4) Draw a circle and create sectors "pie slice" using a protractor based on the obtained angle measures.



Alternatively, the teacher may introduce graphing using Excel.

Step 1. Input your data into EXCEL.

Step 2. Click Insert from the menu bar, click Chart followed by Pie. Choose from the options.

Step 3. Adjust your labels and legends, if desired.

3. Lesson Activity

Perform the following activities following the steps from the examples and be guided by the rubric.

Criteria	Points	Accumulated Points
Accuracy of Solution	7	
Correct Distribution of Data in percent	5	
Proper use of mathematical symbol	2	
Correct interpretation and final answer	6	
Total	20	

A survey was conducted on 50 Grade 7 learners to determine what is their favorite fruit. The results were gathered and organized using a Frequency Distribution Table, as shown below. Complete the table and create a pie graph out of it.

Grade 7 Favorite Fruits					
Mango	Guava	Apple	Banana	Grape	Total
15	14	6	6	9	

D. Making Generalizations

1. Learners' Takeaways

KWL – Activity

PENTOWRITE: This activity will be answered individually to monitor each learner about their understanding of the lesson.

What I Know	What I'm Learning	My New Learnings

The teacher in this part will let the learner fill in the KWL chart to identify their takeaways of the lesson.

2. Reflection on Learning

1. Why do we need to use a pie chart in presenting a set of data?
2. When do we choose a pie chart to present the data?

The teacher may use essay writing to share the learners' experiences.

IV. EVALUATING LEARNING: FORMATIVE ASSESSMENT AND TEACHER'S REFLECTION	NOTES TO TEACHERS

A. Evaluating Learning

DAY 4

1. Formative Assessment

1. Complete the frequency distribution table below:

Category	Frequency	Relative Frequency	Percentage
Male	26		
Female	31		
Total	57		

2. Fifty Grade 7 learners were asked about their favorite destination in the Philippines every summer vacation. The table shows the result. Construct a pie chart out of the given data and explain each part of the pie chart based on the distribution of the data.

Destination	Number of Students
El Nido	8
Boracay	5
Baguio	14
Bohol	11
Cebu	12

2. Homework (Optional)

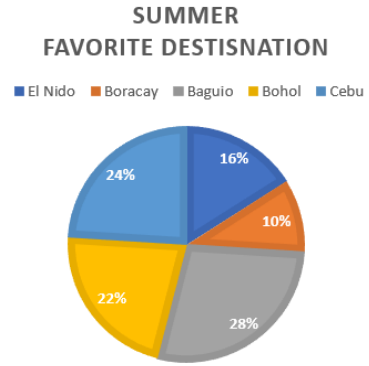
The data below is the result of the voting during the Grade 7 parents' meeting on the agreement of the asynchronous class.

Responses	Frequency	Relative Frequency	Percentage
Strongly Agree	10		
Agree	8		
Disagree	9		
Strongly Disagree	8		
Total	35		

a. Complete the frequency distribution above to determine the relative frequency and percentage of each category.
b. Construct a pie chart to represent and explain the data graphically.

The teacher may use the worksheets for formative assessment.

Answer Key:

1. Relative Frequency
   Male: 0.46
   Female: 0.54
   Percentage
   Male: 46%
   Female: 54%
2. 

The explanation may vary.

The teacher may add this homework to follow up the lesson on the next day.

<table>
<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>