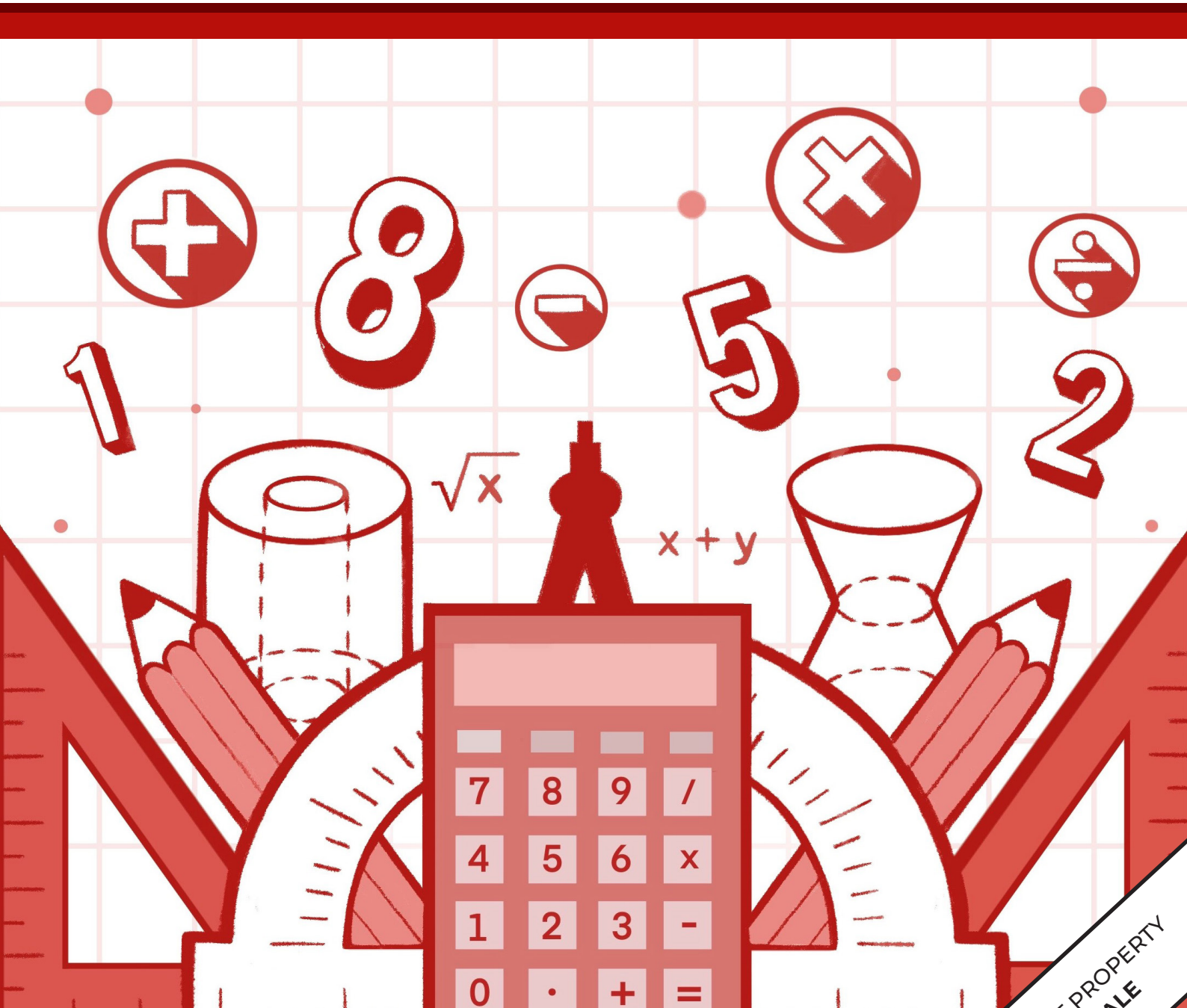


LEARNING STRAND 3 MATHEMATICAL & PROBLEM-SOLVING SKILLS

SESSION GUIDES FOR MODULE 7:
DESCRIBING THE WORLD THROUGH NUMBERS AND DATA

ALS Accreditation and Equivalency Program: Junior High School



SESSION GUIDES

Alternative Learning System - Accreditation and Equivalency (ALS-A&E)

JUNIOR HIGH SCHOOL: MATHEMATICAL AND PROBLEM-SOLVING SKILLS
SESSION GUIDES FOR MODULE 7 (DESCRIBING THE WORLD THROUGH NUMBERS & DATA)

ALS Accreditation and Equivalency Program: Junior High School
Learning Strand 3: Mathematical and Problem-Solving Skills
Session Guides for Module 7 (Describing the World Through Numbers and Data)

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DEVELOPMENT TEAM



Jenelyn Marasigan Baylon
Kristine Lee S. Lumanog
Judy R. Mendoza
Reyangie V. Sandoval
Josephine C. Intino
Eric U. Labre
Roderick P. Corpuz
Daisy Asuncion O. Santos
Marilette R. Almayda
Ariz Delson Acay D. Cawilan
G. H. S. Ambat

Tonisito M. C. Umali

Leonor Magtolis Briones

Master Teacher I, ALS Task Force (On-detail)
Education Program Specialist II, ALS Task Force (On-detail)
Project Development Officer III, Bureau of Learning Resources
Education Program Specialist II, Bureau of Learning Resources
Senior Education Program Specialist, Bureau of Curriculum Development
Senior Education Program Specialist, Bureau of Learning Resources
Supervising Education Program Specialist, ALS Task Force
Chief Education Program Specialist, Bureau of Learning Resources
Director III/Head, ALS Task Force
Officer-In-Charge, Office of the Director IV, Bureau of Learning Resources
Assistant Secretary for Alternative Learning System Program
and Task Force
Undersecretary for Legislative Liaison Office, External Partnership Service
and Project Management Service
Secretary



Ermil P. Gabuat/
Christian Renegado
Ramonette Ruzgal
Bernadette Sison
Mildred Parbo
Ma. Teresita Medado

Author
Content Expert
Admin and Finance Staff
Project Lead
President

Content and Language Evaluators and Instructional Design Reviewer

Elizabeth B. Dizon
Antonio Palma Gil
Ringwald Sarmiento

Schools Division Office of Cavite Province, Department of Education
Regional Office XI – Davao, Department of Education
Freelance Language Editor



United Nations
Educational, Scientific and
Cultural Organization

Ade Sandra
Rusyda Djamhur
Marmon Abutas Pagunsan
Remegio Alquitran
Maria Karisma Bea Agarao
Mee Young Choi
Shahbaz Khan

Admin and Finance Assistant
Project Assistant
National Project Consultant
National Project Officer
National Programme Coordinator
Head of Education Unit
Director and Representative

User's Guide

For the ALS Teacher/Instructional Managers/Learning Facilitator:

Welcome to the session guide of this module entitled Describing the World Through Numbers and Data under Learning Strand 3 Math and Problem-Solving Skills of the ALS K to 12 Basic Education Curriculum (BEC).

The module and the session guides were collaboratively designed, developed and reviewed by select DepEd field officials and teachers from formal school and ALS, and private institutions to assist in helping the ALS learners meet the standards set by the ALS K to 12 Basic Education Curriculum (BEC) while overcoming their personal, social, and economic constraints in attending ALS learning interventions.

This learning resource hopes to engage the learners in guided and independent learning activities at their own pace and time. Furthermore, this also aims to help learners acquire the needed 21st Century skills while taking into consideration their needs and circumstances.

As an ALS Teacher/Instructional Manager/Learning Facilitator, you are expected to orient the learners on how to use this module. You also need to keep track of the learners' progress while allowing them to manage their learning. Moreover, you are expected to encourage and assist the learners as they do the tasks included in the module.

EXCUSE ME, MAY I ASK YOU A QUESTION? Session Guide No. 1

I. Duration of Session: 3 hours

II. Key Understandings to be Developed

- Statistical Instruments
- Types of Questions

III. Learning Objectives

1. Formulate simple statistical instruments (LS3MP-SP-PSF-JHS-22)
2. Conduct a simple survey (LS3MP-SP-PSF-JHS-41)

IV. Resources (if available)

- Handout (slam book template) for the activity

V. Activity

1. Form five groups and ask each group to provide the information asked in the Slam Book on page 6. Let each learners compare their answers within the group. *The activity is designed to simulate the process of gathering raw data with which information can be induced from using a simple survey.*
2. After the activity, ask one member of each group to share their answers in front of the class.

VI. Analysis

1. Explain that the process of getting information through a survey is the one most used as it saves effort, time, and other resources.
2. Explain that aside from doing a survey, there are other ways of collecting information that will be discussed in the lesson.
3. The goal of the lesson, however, is to learn to design their own survey depending on its purpose.

ABOUT ME

PHOTO


Name: _____
Email: _____ Blog/Website: _____

MY FIRST

First big achievement: _____
First risk I ever took: _____
First time I felt completely happy: _____


MY FAVES

Color/s: _____
Perfume: _____
Music: _____
Singer/s: _____
Song: _____
Food: _____
Weekend Activity: _____



HOBBIES

TV Show: _____
Movie: _____
Book: _____
Celebs: _____
Role Model: _____



AMBITION

MOTTO

Slam Book template for the Activity

VII. Abstraction/Generalization

1. Present the definition and examples. See page 7–14
2. **Data and population:**
 - Give examples of data collected in a biodata or when filling out application forms such as name, gender/sex, civil status, religion, height, weight, etc.
 - Ask learners to provide their own example on how they collect data in everyday life.
 - Explain that a population may refer not only to humans but other collection of objects and animals as well. Use examples of the total number of people in a barangay, a city or province, and of the country to explain what the word means.
3. **Types of collecting data:**
 - Explain that to observe is to watch subjects of interest and list down their characteristics.
 - Explain that surveys come in many forms such as in application documents where information is asked, the same procedure done in the activity where a survey form is given, and even the signing up process done in social media when creating accounts on Facebook, Twitter, and YouTube, etc. are also forms of survey.

Create a new account
It's free and always will be.

First name Surname

Mobile number or email address

New password

Birthday
14 Jul 1999 Why do I need to provide my data of birth?
 Female Male

By clicking Create Account, you agree to our Terms and confirm that you have read our Data Policy, including our Cookie Use Policy. You may receive SMS message notifications from Facebook and can opt out at any time.

Create Account

Name
John Carry

Choose your username
 @gmail.com
[I prefer to use my current email address](#)

Create a password

Confirm your password

Birthday
Month Day Year

Gender
I am...

4. Types of survey:

- Explain that interviews can give more details and context to answers of respondents but is impractical when a large population is required because large amounts of time and money will be needed.
- Questionnaires are used for convenience because it can gather information from more people in a (relatively) shorter period and less amount of money and other resources spent. However, questionnaires are limited to short answers that may fail to give context to results of information.
- Explain that a population may refer not only to humans but other collection of objects and animals as well. Use examples of the total number of people in a barangay, a city or province, and of the country to explain what the word means.

5. Types of questions used in a survey:

- Provide help to the learners to decide on appropriate type of questions needed to be used depending on the information they would like to gather.
- Explain the pros and cons of the different types of questions used in a survey.

VIII. Application

1. Ask the learners to compare the statistical instruments.
2. Present the *Sharpening Your Skills* and *Treading the Road to Mastery* assessments on pages 15–16 which aim to practice the following skills:
 - a. creating different types of questions for a questionnaire suited to the information being gathered.
 - b. creating a simple survey questionnaire to develop the data collecting skills.

3. Process the activity by allowing learners to explain their answers.
See page 16 for the answer key

IX. Concluding Activity

End the session by reviewing the key understandings developed and relating the concepts of statistical instruments to real-life scenarios.

Show the actual procedures taken in gathering relevant information through designing an appropriate survey and questionnaire. Learners may conduct a role-play applying ways in gathering data and using the survey designed.

LET'S ORGANIZE THIS **Session Guide No. 2**

I. Duration of Session: 3 hours

II. Key Understandings to be Developed

- Translate data into statistical graphs

III. Learning Objectives

1. Describe the different kinds of graphs used to organize and present data in real life situations (LS3MP-SP-PSF-BL/LE/AE/JHS-5).
2. Identify the parts of a pictograph, bar graph, and line graph, i.e., title, legend, labels, and vertical and horizontal Axes (LS3MP-SP-PSF-JHS-6).

IV. Resources (none)

- Any measuring tool for the activity

V. Activity

1. Form 5 groups and ask each group to help Betty to summarize the list of answers from a simple survey she did around the community. *The activity is designed to simulate the process of organizing data which is required to be able to transform them into graphs. See page 20–21*

See the list of answers on the next page.

2. Ask the learners to show their answers for each set and to explain how they came up with these answers.

VI. Analysis

1. Explain that the process of organizing data summarizes the values into single values that represent categories making it easier to transform them into graphs that are easily understandable.

A. Favorite hobby:

Singing	Dancing	Singing	Reading a book	Singing
Reading a book	Singing	Listening to music	Singing	Dancing
Listening to music	Singing	Reading a book	Singing	Reading a book
Dancing	Reading a book	Listening to music	Watching TV	Reading a book
Singing	Reading a book	Dancing	Dancing	Singing
Watching TV	Listening to music	Singing	Singing	Dancing

Singing = 11, Dancing = 6, Reading a book = 7, Listening to music = 4, Watching TV = 2

B. Favorite basketball team:

Barangay Ginebra	Alaska Aces	Magnolia Hotshots	Barangay Ginebra	Alaska Aces
Alaska Aces	Magnolia Hotshots	Alaska Aces	Magnolia Hotshots	Alaska Aces
TNT Katropa	Magnolia Hotshots	Barangay Ginebra	TNT Katropa	TNT Katropa
TNT Katropa	Barangay Ginebra	TNT Katropa	Alaska Aces	Alaska Aces
Magnolia Hotshots	Alaska Aces	Alaska Aces	Magnolia Hotshots	Magnolia Hotshots
Alaska Aces	Magnolia Hotshots	Barangay Ginebra	Barangay Ginebra	Magnolia Hotshots

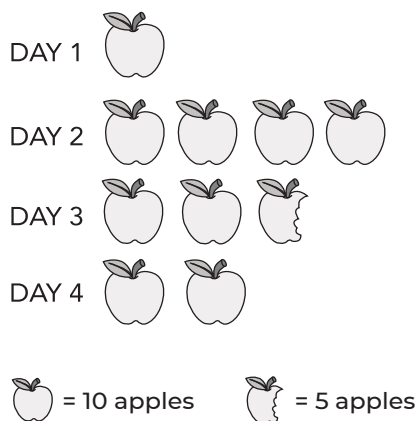
Barangay Ginebra = 6, Alaska Aces = 10, Magnolia Hotshots = 9, TNT Katropa = 5

2. Provide an example that if the height of all Filipinos is taken, it will result into a hundred million data and it will be hard to make sense of it unless it is organized. This also helps in determining the appropriate type of graph to be used.
3. Explain that the goal of the lesson is to transform different sets of data into graphs that are easier to understand and more visually appealing to people.

VII. Abstraction/Generalization

1. Present the definition and examples. See page 22–32
2. **Pictograph:**
 - Emphasize that commonly, the object being used represents the image selected in a pictograph.

For example, if the topic is about number of students then use images of boys/girls, if about scores in a basketball game then use an image of a scoreboard in a basketball game, if about the number of fruits then use the image of a specific fruit, and so on.



- Ask the learners to provide their own examples of a pictograph.
- Remind that a legend must be included to show what value one picture is equivalent to such as 5, 10, 100, 500, or 1000. The larger the total values are, the bigger the number each picture should represent.

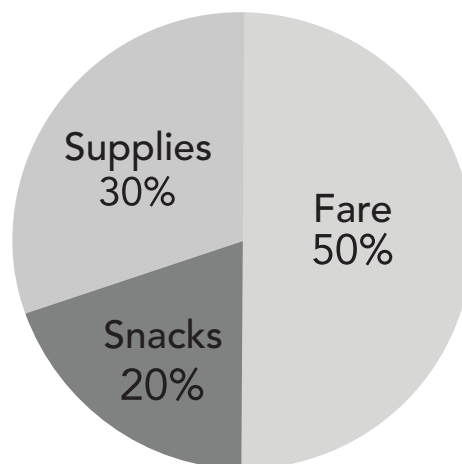
- Emphasize that images can also be cut down in half or quarters to depict exact values in a pictograph. If one car represents 100 cars in a parking lot, then a half image represents 50, while a quarter image represents 25.

3. Pie chart:

- Remind the learners that the portions of the circle must accurately depict the value it represents.

For example, a value of 25% must not occupy a bigger portion than the value of 50%. Use the pizza method to show this.

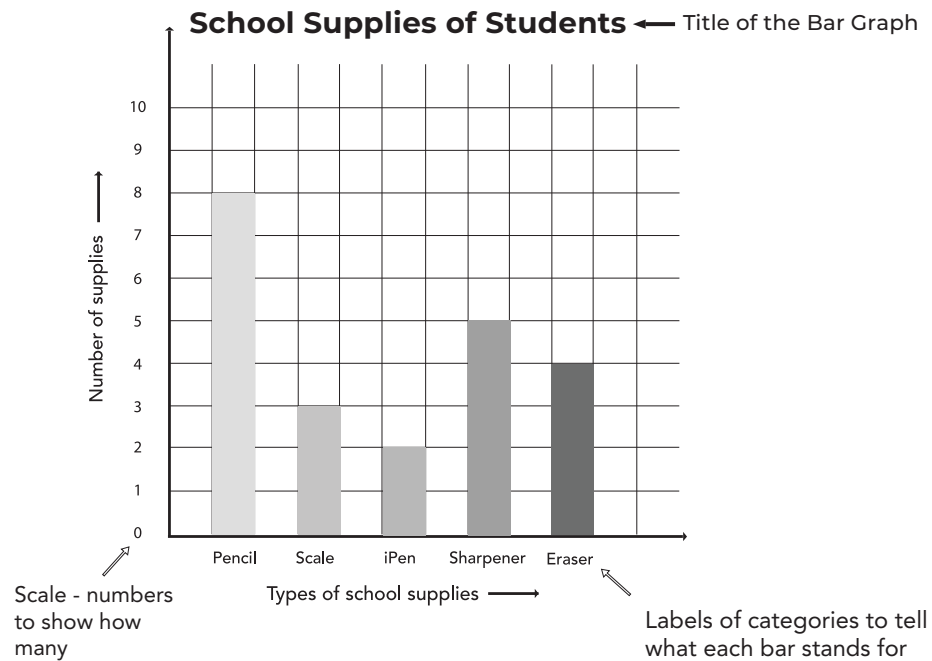
Jaymie's Budget



- Label what category each portion represents and by how much percentage.

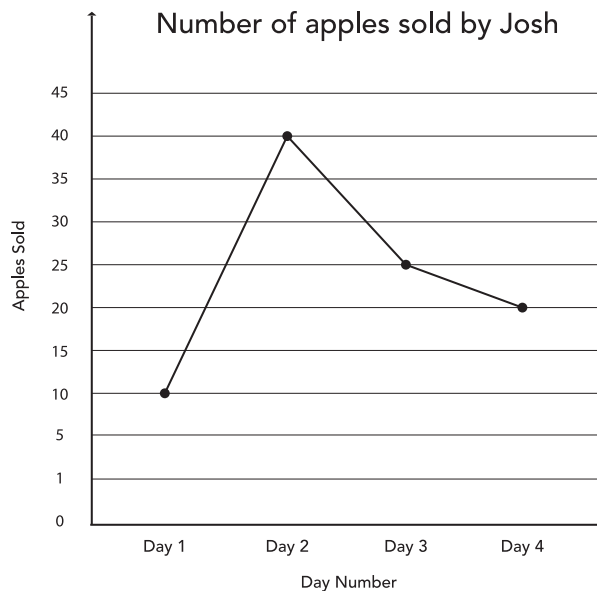
4. Bar graph:

- Remind the students that the length of each bar must be the same as the value of the category being represented. They can label the bar using the exact number it represents.
- Emphasize that intervals between the numbers in the axis must be consistent. Label the axes correctly.



5. Line graph:

- Instruct learners to plot the points for each category first. After plotting the points, then these can be connected by straight lines. Points must be labeled with the value they represent.



- Emphasize that intervals between the numbers in the axis must be consistent. Label the axes correctly.

6. Learners might need help in deciding the bigger values especially for decimals and fractions. Help learners by transforming the values in decimal form (which is how money is expressed) to easily compare. like ₱1,500,000 million to ₱1.5 million.

VIII. Application

1. Ask the learners to discuss the different measures of central tendency.
2. Present the *Sharpening Your Skills* and *Treading the Road to Mastery* assessments on pages 33–36 which aim to practice the following skills:
 - a. solving for the measures of central tendencies for ungrouped data.
 - b. setting up the columns for class boundaries, midpoint and cumulative frequency in a frequency distribution table of a grouped data.
 - c. setting up the columns for class boundaries, midpoint and cumulative frequency in a frequency distribution table of a grouped data.
 - d. solve for the measures of central tendencies of a grouped data.
3. Process the activity by allowing the learners to explain their answers. See page 16 for the answer key

IX. Concluding Activity

End the session by reviewing the key understandings developed and relating the concepts of measures of central tendency to real-life scenarios. *Best if the key understanding comes from the learners and encourage them to cite another real-life application of measures of central tendency.*

SO, WHAT DO YOU MEAN? Session Guide No. 3

I. **Duration of Session:** 3 hours

II. **Key Understandings to be Developed**

- Reading, interpreting, and drawing conclusions from statistical graphs

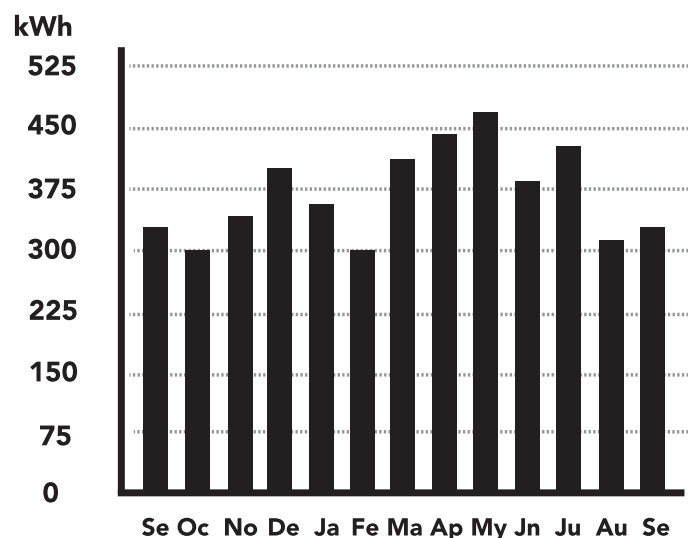
III. **Learning Objectives**

1. Read/interpret data presented in a graph.
(LS3MP-SP-PSF-JHS-8)
2. Make comparisons of data presented in a graph.
(LS3MP-SP-PSF-JHS-9)
3. Draw inferences and conclusions based on analysis of data presented in graphs and tables. (LS3MP-SP-PSF-JHS-10)

IV. **Resources** (none)

V. **Activity**

**Your Monthly Electricity Consumption Chart
September '06 - September '07**



1. Ask the learners to help Betty interpret an electric bill. *The activity is designed to gauge the learner's interpretation of a given graph that they may encounter in different forms whether it be in documents, social media, and other information campaigns.*
2. Ask the learners share their answers to the rest of the class.

VI. Analysis

1. Based on the activity, ask the following questions.
 - What type of graph is given? What is it about?
 - What is the value of the interval?
 - What do the vertical bars mean?
 - When did the highest value occur?
 - When did the lowest value occur?
2. Discuss the answer in the Learner's Module. Page 42
 - *What type of graph is given? What is it about?*
All parts of a graph are important. The first one to check is the **title**, then the type of graph because it gives an idea as to what the graph is representing.

The given is a bar graph with the title "Your monthly electricity consumption chart". It shows the amount of electricity used in the household every month.
 - *What is the value of the interval?*
Examine the axes for bar graphs and line graphs as it will tell you how to read the values accurately. In this example, the interval is 75 between the numbers on the vertical axis.
 - *What do the vertical bars mean?*
The vertical bars show the value of the consumption for each month by the household.
 - *When did the highest value occur?*
The highest value of consumption occurred on May '07.

- *When did the lowest value occur?*
The lowest value of consumption occurred two times, October '06 and February '07.
3. Explain that graphs are done to make interpretations of data presented in it to make logical conclusions as learners might come across them at work or information given to them.
 4. Explain that different graphs have different meanings of numbers whether it be for comparison or describing certain groups or categories.

VII. Abstraction/Generalization

1. Recall the definition and use of each statistical graph.
See page 39–46
 - Pictographs show the value using pictures or symbols
 - Pie graph is used to show the distribution of different parts making a whole group
 - Bar graph is used to compare values of different criteria
 - Line graph is used to show the changes of values over time
2. When interpreting data, remind the learners that it is important to know the parts of the graph and what they represent.
3. Explain that interpreted data in the graph can also aid in comparing information.

VIII. Application

1. Ask the learners on how to read and correctly interpret and deduce meanings of different graphs that they encounter in different situations.
 - Learners may provide examples such as electricity and water bills, performance rate output, profit sales and monetary loss, etc.

2. Present the *Sharpening Your Skills* and *Treading the Road to Mastery* assessments on pages 47–51 which aim to practice the following skills:
 - a. interpreting information presented in a graph and answering questions related to the graph and situation involved.
 - b. describing the content or context of the graph and identifying important data values present in the graph.
 - c. understanding the situation that a graph represents.
 - d. making judgment based on the values present in a graph.
 - e. finding trends or patterns to correctly interpret what the data mean.
3. Process the activity by allowing learners to explain their answers.
See page 16 for the answer key

IX. Concluding Activity

End the session by reviewing the key understandings developed and relating the concepts of reading and interpreting statistical graphs in real-life scenarios.

Ask the learners to look for some documents in their homes and interpret the graphs.

PRE-ASSESSMENT

PAGE 2

- | | | |
|------|-------|-------|
| 1. C | 6. A | 11. C |
| 2. B | 7. D | 12. B |
| 3. B | 8. C | 13. A |
| 4. C | 9. B | 14. D |
| 5. B | 10. A | 15. B |

LESSON 1: EXCUSE ME, MAY I ASK YOU A QUESTION?

SHARPENING YOUR SKILLS

PAGE 15

ACTIVITY I

1. Sample questions answerable by Yes or No.
 - a. Are you in favor of the no homework policy in schools?
 - b. Do you agree with the suggestion of banning old jeeps for public transport?
 - c. Are you in favor of legalizing marijuana for medical purposes?

2. Sample questions measuring level of feeling about a topic.
 - a. I feel okay about the growing presence of Chinese workers in the Philippines.

STRONGLY AGREE	AGREE	DISAGREE	STRONGLY DISAGREE

- b. The movie I watched was well made

STRONGLY AGREE	AGREE	DISAGREE	STRONGLY DISAGREE

3. Sample questions should have multiple choices.
 - a. Which of the following is your favorite hobby?
 - Singing

ANSWER KEY

- Dancing
 - Reading a book
- b. What is your most preferred basketball team in the PBA?
- Barangay Ginebra
 - Alaska Aces
 - Magnolia Hotshots
- c. What dish is best paired with rice?
- Adobo
 - Sinigang
 - Nilaga
4. Sample questions must be answered using a rating scale
- a. On a scale of 1–5, with 5 being the highest, how much did you enjoy the movie you watched?

5	4	3	2	1

- b. On a scale of 1–5 , with 1 being the lowest, how difficult can you say the exam was?

5	4	3	2	1

TREADING THE ROAD TO MASTERY

Guidelines for Types of Questions

- **Dichotomous:** Question should be answerable using only two options.
- **Multiple Choice:** Question should have multiple choices presented to the respondent.
- **Rating Scale:** Question should use a rating scale (choice of numbers) to answer a question.
- **Likert Scale:** Question should measure level of agreement on a certain topic.

RUBRICS IN MAKING A SIMPLE SURVEY			
	3	2	1
Are all questions relevant to the topic chosen	All the questions included are important to answering the chosen topic problem.	There are some questions that are not related and needed in answering the topic problem.	All questions are not relevant or needed in answering the topic problem.
Are all types of questions used correctly? (Refer to the guide above)	All types of questions were used correctly to accurately gather needed information to answer the topic problem.	Some types of questions are incorrectly used and do not help in answering the topic problem.	All questions are incorrectly used and do not answer the topic problem completely
Are demographics correctly placed?		Demographics are included in the survey.	Demographics are not included in the survey.
Presentation: Was the survey explained clearly?		All items in the survey were explained clearly.	Some items in the survey were not explained clearly.
TOTAL: 10 POINTS			

LESSON 2: LET'S ORGANIZE THIS

SHARPENING YOUR SKILLS

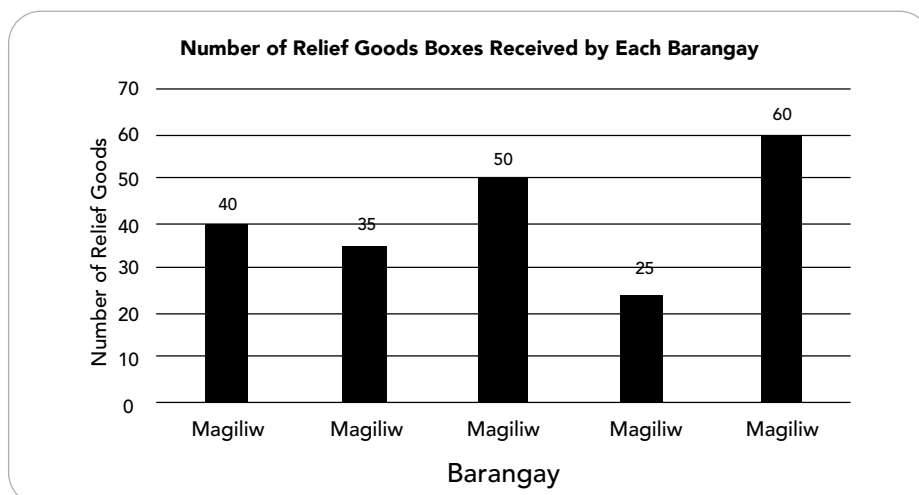
PAGE 33

ACTIVITY I

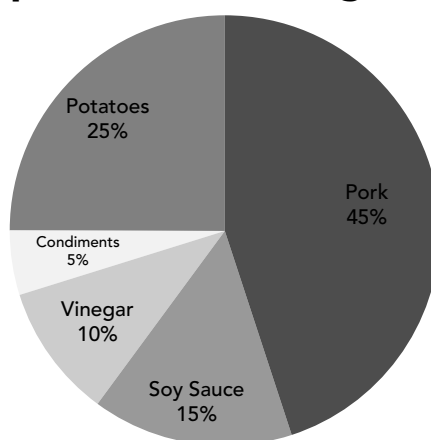
1. bar graph or pictograph
2. line graph
3. pie chart
4. line graph
5. bar graph or pictograph
6. line graph
7. pie chart
8. line graph
9. bar graph or pictograph
10. bar graph or pictograph

ACTIVITY II

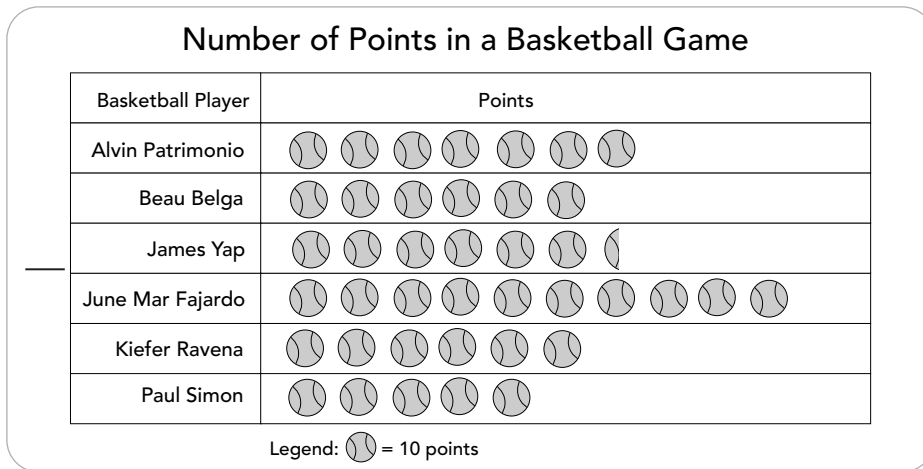
1.



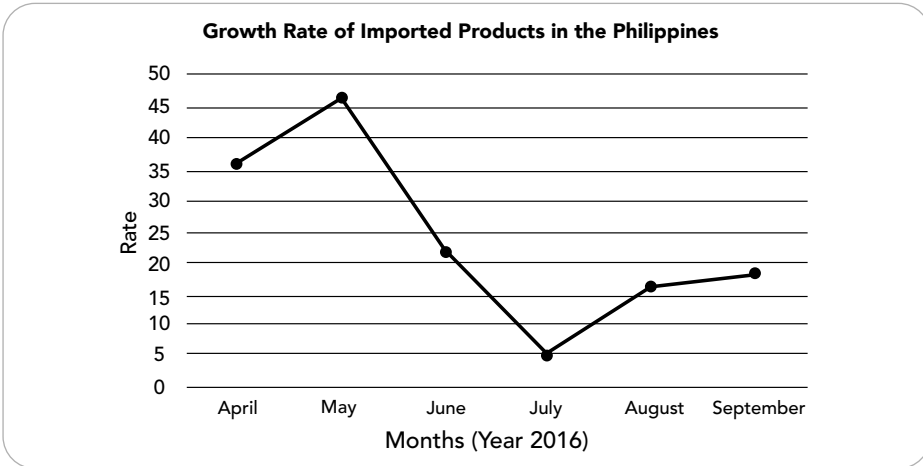
2.

Expenses for Cooking Adobo

3.



4.



1. Use a pie chart

- Each part of the pie should represent an item where the budget is used for.
- Indicate the name and the percentage occupied by each part of the pie.
- Indicate the title of the pie chart above or below.

2. Use a bar graph

- For vertical bar graph:
The horizontal axis should have the names of the sari-sari stores, vertical axis should have the amount of earnings using the appropriate interval.
- For horizontal bar graph:
The vertical axis should have the names of the sari-sari stores, horizontal axis should have the amount of earnings using the appropriate interval.
- Indicate the name of the axes used. Write the title of the bar graph above or below the image.
- Make sure that the bars are correctly aligned to the values they represent. Write the value at the top of (vertical) or beside (horizontal) each bar.

3. Use a line graph

- The horizontal axis should contain each day of the week. The vertical axis should contain the amount of profit using appropriate intervals.

ANSWER KEY

- Make sure each point representing each day is aligned with the correct value of profit.
- Label each point with the correct values. Connect the points in the line graph.
- Indicate the name of the line graph above or below the line graph.

LESSON 3: SO, WHAT DO YOU MEAN?

SHARPENING YOUR SKILLS

PAGE 47

ACTIVITY I

1.
 - a. Commercial
 - b. Industrial
 - c. Transportation = 145,000
Electric Power = 40,000
Industrial = 32,500
Commercial = 10,000
Residential = 22,500

2.
 - a. most preferred is bus
least preferred is train
 - b. car
 - c. 135
 - d. ₱675

ACTIVITY II

- a. Distribution of OFWs in each region
- b. Interval of 5 was used
- c. There are eighteen (18) regions being compared
- d. Region IVA
- e. Caraga, ARMM, & CAR

TREADING THE ROAD TO MASTERY

PAGE 50

1. The student should mention the following:
 - The bar graph shows the preference of students for after-school activities.
 - The horizontal axis shows the number of students, the vertical axis shows the type of activities
 - There are eight (8) activities being compared
 - Intervals of 20 were used
 - Most favorite activity is Visit with Friends (99)
 - Least favorite activity is School Clubs (22)

2. The student should mention the following:
 - The pie chart shows the cost of home construction
 - There are six (6) categories being compared
 - Labor takes the highest percentage in constructing a home (25%)
 - Wood takes the lowest percentage in constructing a home (10%)

3. The student should mention the following:
 - The line chart shows the changes in the unemployment rate over the years
 - There are seven (7) years being compared
 - Unemployment rate is decreasing from 2013 to 2016, increasing from 2016 to 2017, decreasing from 2017 to 2018, and increasing from 2018 to 2019
 - The highest unemployment rate happened in 2013 (7.1)
 - The lowest unemployment rate happened in 2018 (5.3)

REACH THE TOP

PAGE 56

1. a
2. d
3. c
4. a
5. b
6. c
7. d
8. c
9. a
10. b
11. a
12. b
13. c
14. c
15. a

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For inquiries, please contact:

Department of Education, Bureau of Learning Resources (DepEd BLR)

Office Address : Ground Floor, Bonifacio Building, DepEd Complex,
Meralco Avenue, Pasig City, Philippines 1600
Telefax : +63-2-8631-1072; +63-2-8634-1054; +63-2-8631-4985
Email Address : blr.qad@deped.gov.ph; blr.lrpd@deped.gov.ph