



SUBJECT and GRADE	Mathematical Literacy Grade 10	
TERM 4	Week 3	
TOPIC	Data Handling	
AIMS OF LESSON	Summarise and present data	
RESOURCES	Paper based resources	Digital resources
	Mind the GAP: Page 140 Answer Series Also use: Via Afrika Platinum Or any CAPS approved textbook. Look under Financial Documents	Learn.mindset,Africa/xtra/lessons/grade10/maths-literacy You tube data handling
INTRODUCTION	<u>By the end of the week you need to be able to work with the following:</u> - Summarise single set of collected data - Mean - Median mode - Range With understanding of the following: - The function/purpose of the measures of central tendency and spread - The measure of central tendency referred to when the term “average” is used <u>Previous knowledge</u> • Operations with whole numbers and decimal numbers and without a calculator (Brackets Of Divide Multiply Add Subtract) • Rounding-off: to specific number of decimal places, to the nearest whole number, up or down • Developing questions • Collecting data • Classifying and organizing data The above were done in Term 1	
CONCEPTS AND SKILLS	<u>Required terminology:</u> Data: is raw information that has been collected, without any organisation or analysis.	

Data handling: refers to the process of collecting, organizing, summarizing, representing and analyzing information, in order to answer a question or make an informed decision.

Why is data handled? The purpose of processing data is to make it more meaningful. A large collection of numerical values, for example, is not very meaningful to most people, while tables, graphs and diagrams are usually far more appealing and self-explanatory.

Classifying data:

Categorical data and numerical data

- **Categorical data** is generally descriptive in nature, as data is classified and organized into categories.
 - Data can be observed but not measured.
 - Examples include textures, smells, tastes, appearance, gender (male or female), eye colour, months of the year, age group, shoe sizes and country of birth.
 - Categorical data can consist of 'yes' or 'no' answers.
- **Numerical data** refers to data consisting of quantities or numerical values.
 - Examples include: measurements e.g. length, height, area, volume, mass, speed, time, temperature, rainfall, humidity, sound levels, cost, members, ages, etc.

Numerical data can be further classified into discrete data or continuous data:

Discrete data is a set of values that can be **counted**, e.g.

- The number of children in a family
- The number of cars in a parking lot
- The number of people standing in a queue

Continuous data is data that you **measure** e.g.:

- The height of a learner
- The mass of a learner
- The time taken to run a race

Three Measures of central tendency:

1. **Mean:** commonly referred to as the 'average'

To calculate the mean, you add all the values of the data set and divide this sum by the total number of values in the data set.

Worked Example 1:

The soccer team kept a record of the number of goals scored, as shown below, in all the matches they played in the recent season:

1 7 9 4 3 5 8 3 2 8

- a) How many matches did the soccer team play?
- b) Calculate the mean score.
- c) How many matches produced a result above the mean score?

Median: is the middle value of a data set that is arranged

- If there is an odd number of values in the data set, the middle value will be the median
- If there is an even number of values in the data set, you will have two values in the middle. In this case, you need to find the **mean** of these two values, i.e. add them together and divide by 2.

Worked Example 2

1. Odd number data values

The list below shows the first round scores obtained by the golfers in a school tournament:

83 89 88 90 89 84 82 86 89 87 86

Determine the mean score.

2. Even number of data values

The soccer team kept a record of the number of goals scored, as shown below, in all the matches they played in the recent season:

1 7 9 4 3 5 8 3 2 8

Calculate the median score.

Mode: is the value (or values) in the data set, that occur(s)

Worked Example 3

1. The coach wanted to order juice for the netball match and the girls in the team were asked which flavor juice they preferred. Their responses are listed below.

orange	strawberry	orange	strawberry	orange
coke	lemon	litchi	orange	orange

1.1. If the coach was ordering one flavor, what should it be?

1.2. What do we call this measure of central tendency?

2. The list below shows the first round scores obtained by the golfers in a school tournament.
Determine the mode.

83 89 88 90 89 84 82 86 89 87 86

3. The soccer team kept a record of the number of goals scored, as shown below:

1 7 9 4 3 5 8 3 2 8

Calculate the modal score

Exercise 1:

1. In a Maths Literacy exam, 12 learners scored the following marks (%):

58 62 91 64 78 53 28 40 66 13 86 60

Calculate the:

1.1 mean

1.3 mode

1.2 median

1.4 range

2. The following money was spent at the school tuck shop during a week:

Day	Amount spent
Monday	R456,85
Tuesday	R236,90
Wednesday	R236,90
Thursday	R429,25
Friday	R1 123,45

- 2.1 What was the mean amount of money spent at the school tuck shop?
2.2 What was the median amount of money spent per day?
2.3 What is the mode?
2.4 What is the range of the money spent during the week?

Representing Data:

Once you have collected, organized and summarized your data you need to represent it in a useful way.

Data can be represented in different ways.

- Pie charts
- Single bar graphs
- Histograms
- Line and broken line graphs

Pie charts

- Pie charts are circular, like a pie that has been cut into several pieces.
- Each portion of the pie can be written as a fraction, a decimal fraction or a percentage, i.e. all parts will add up to a whole or 100%
- A pie chart is often use for representing **categorical** data.

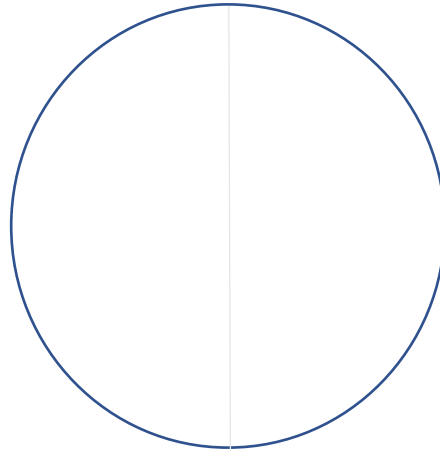
You will not be asked to draw pie charts in the, but you must be able to interpret and read values from a pie chart and be able to explain how the sizes of the different segments have been determined.

Exercise 2

- 1.1 The table below shows the breakdown of water use per person in a Cape Town household (Source: <http://www.capewatersolutions.co.za>). Complete the angle of sector column in the template below.

Destination of water	Percentage	Calculation	Angle of sector
Garden	35%	$\frac{35}{100} \times 360^\circ$	
Toilet	29%	$\frac{29}{100} \times 360^\circ$	
Bath / shower	20%	$\frac{20}{100} \times 360^\circ$	
Laundry	13%	$\frac{13}{100} \times 360^\circ$	
Drinking / cooking	3%	$\frac{3}{100} \times 360^\circ$	
		Total	

1.2 Complete the pie chart, using the above angle sectors:



2. A person uses 250 liters of water each day.

2.1 Calculate the amount of water a person would use in one month (30 days).

2.2 Calculate the amount of water a family of five would consume in one month (30 days).

2.3 Given that it is estimated that 29% of the water consumed by a person is flushed down the toilet, calculate the volume of water flushed down the toilet by a household of five in one month (30 days).

Solutions

Work example 1

a. 10 matches as there are 10 scores.

$$\begin{aligned} \text{b. Mean} &= \frac{\text{sum of all values in data set}}{\text{total number of values in the data set}} \\ &= \frac{1+7+9+4+3+5+8+3+2+8}{10} = \frac{50}{10} = 5 \end{aligned}$$

c. 4 matches as there were 4 scores greater than 5 (i.e. 7; 9; 8 and 8)

Work example 2

1. Arrange data in ascending order (from smallest to biggest)

82 83 84 86 86 87 88 89 89 89 90 Halve the data into equally sized groups

The middle value is the median

The median golf score = **87**

2. Arrange data in ascending order:

1 2 3 3 4 5 7 8 8 9



The middle value is the median

Find the average of the middle value:

$$\text{Median} = \frac{4+5}{2} = \frac{9}{2} = 4,5$$

The median match score is 4,5 goals

Work example 3

- 1.1 Orange juice because 5 out of 10 girls preferred it.
- 1.2 Mode
2. Mode is 89
3. 3 and 8 have the highest frequency – they both appear twice
The data is said to be **bi-model**

Exercise 1

1.1 $\text{mean} = \frac{699}{12} = 58,25$

1.2 13; 28; 40; 53; 58; 60; 62; 64; 66; 78; 86; 91

$$\text{Median} = \frac{60+62}{2} = 61$$

1.3 no mode

1.4 $\text{range} = 91 - 13 = 78$

$$2.1 \quad \text{mean} = \frac{2\,483,35}{5} = R496.67$$

$$2.2 \quad 236,90; 236,90; 429,25; 456,85; 1\,123,45$$

$$\text{Median} = R429,25$$

$$2.3 \quad \text{mode } R236,90$$

$$2.4 \quad \text{range} = R1\,123,45 - R236,90 = R886,55$$

Exercise 2

1.1

Garden	$\frac{35}{100} \times 360^\circ$	126°
Toilet	$\frac{29}{100} \times 360^\circ$	104,4°
Bath / shower	$\frac{20}{100} \times 360^\circ$	72°
Laundry	$\frac{13}{100} \times 360^\circ$	46,8°
Drinking / cooking	$\frac{3}{100} \times 360^\circ$	10,8°
	Total	360°

1.2 To be completed in class with teachers' guidance.

$$2.1 \quad 250 \text{ L} \times 30 \text{ days} = 7\,500 \text{ liters}$$

$$2.2 \quad 7\,500 \text{ L} \times 5 = 37\,500 \text{ liters}$$

$$2.3 \quad \frac{29}{100} \times 37\,500 \text{ l} = 10\,875 \text{ l}$$

CONSOLIDATION

Make sure that after going through this lesson you can:
Determine the measures of central tendency and spread
Data in different ways can represent

VALUES

Work independently.

Calculate accurately.