STRONG TOWER ACADEMY

NAME OF TEACHER: WHENU, B, S (MR)

SUBJECT:- MATHEMATICS

WEEK: ONE (1)

CENTRAL THEME:-MEASURE OF CENTRAL TENDENCY

TOPIC:- MEAN

CLASS:- SS2

DURATION:- 80 Minutes

Objectives: At the end of the lesson, the students should be able to:

- define mean.
- state the formula of calculating the mean of a group and ungrouped data.
- solve simple calculations using the formula.

Reference Books:

1) Essential Mathematics, Book two (senior) by Adeola A. J Oluwasanmi
2) New General Mathematics, Book two (senior) by M . F Macrae et al

Content:- **Measures of Central Tendency:-** This is also called measures of location . They are statistical average used to provide descriptive summary of a data and also used to describe the general location of the data. Examples are: (1) Mean (ii) Median (iii) Mode.

(1) Mean or Arithmetic Mean:- This is the average of a set of numbers. It is derived by adding the values in a set together, divided by the number of values in the set. Mean is denoted by X

Examples:

(1)Find the mean of the data below

5, 9, 3, 4, 5, 8, 2, 4, 1, 13.

Solution:

Mean, $X = \frac{\Sigma X}{N} = \frac{5+9+3+4+5+8+2+4+1+13}{10} = \frac{54}{10} = 5.4$

(2) If the mean of x, 2x, 3x, 4x and 5x is 20. Find the value of x

Solution

Mean, X = $\frac{\Sigma X}{N} = \frac{x+2x+3x+4x+5x}{5} = \frac{15x}{5}$

$\frac{15x}{5} = ¿\ 20$

15x = 20 X 5

15x = 100

x = $\frac{100}{15}$ = 6.7

MEAN OF UNGROUPED DATA

Mean, X = $\frac{\Sigma fX}{\Sigma f}$

Examples: (1) The frequency table below represents the number of Oranges picked by 20 students. Calculation the mean of the data.

X	0	1	2	3	4	5
F	2	5	6	4	2	1

Solution

X	F	Fx
0	2	0
1	5	5
2	6	12
3	4	12
4	2	8
5	1	5
	$\Sigma f = 20$	$\Sigma fX = 42$

Mean, X = $\frac{\Sigma fX}{\Sigma f} = \frac{42}{20} = 2.1$

Evaluation: Determine the mean of the frequency data below

X	1 -10	11 – 20	21 – 30	31 – 40	41 - 50
F	6	8	5	7	10

Assignment: Essential Mathematics for Senior Secondary Schools Book 2, page 210, Exercise 14.1, No.10 - 15

NAME OF TEACHER: WHENU, B, S (MR)

SUBJECT:- MATHEMATICS

WEEK: TWO (2)

CENTRAL THEME:- MEASURE OF CENTRAL TENDENCY

TOPIC:- MEDIAN

CLASS:- SS2

Duration:- 80 Minutes

Objectives: At the end of the lesson, the students should be able to:

- define median.
- state the formula of calculating the median of a group and ungrouped data.
- solve simple calculations using the formula.

Previous Knowledge: The students are familiar with solution of the mean of a set of numbers.

Instructional material: Chart and flash cards showing the formula of calculating the median of a group and ungrouped data.

Reference Books:

i. Essential Mathematics, Book two (senior) by Adeola A. J Oluwasanmi
ii. New General Mathematics, Book two (senior) by M . F Macrae et al

Content: Median is the middle value in a data when the values are arranged in ascending or descending order. Median divides the data into two equal parts.

Examples:

(1)Find the median of the data below

5, 9, 3, 4, 5, 8, 2, 4, 1, 13.

Solution

Re-arrange the number:- 1, 2, 3, 4, 4, 5, 5, 8, 9, 13

Median = $\frac{4+5}{2} = \frac{9}{2} = 4.5$

MEDIAN OF UNGROUPED FREQUENCY DATA

Median = $\frac{N+1}{2}$ **where N is the total frequency**

(2) The frequency table below represents the number of Apples picked by 20 students. Calculation the median of the data.

X	0	1	2	3	4	5
F	2	5	6	4	2	1

Solution

Set the Cummulative frequency table as below

X	F	CF
0	2	2
1	5	7
2	6	13
3	4	17
4	2	19
5	1	20

Median =$\frac{N+1}{2}$ = $\frac{20+1}{2}$ = $\frac{21}{2}$ =10.5th position in CF. from the cumulative table the 10.5th position falls within the value 2 and 2. Thus median =2.

MEDIAN FOR GROUPED FREQUENCY DATA

Median =L + $\frac{\left(\frac{N}{2} - Cfm\right)W}{fm}$ where, L = Lower class boundary of the median class; N = Total frequency; *Cfm*=¿ Cummulative frequency before median: W = Class interval: *fm* = frequency of the median class.

Median =$\frac{N+1}{2}$ or $\frac{N}{2}$

Evaluation: Determine the median of the frequency data below

X	1 -10	11 – 20	21 – 30	31 – 40	41 - 50
F	6	8	5	7	10

Assignment: Essential Mathematics for Senior Secondary Schools Book 2, page 218, Exercise 8.2, No.14.4, No: 9 & 10

NAME OF TEACHER: WHENU, B, S (MR)

SUBJECT:- MATHEMATICS

WEEK: THREE (3)

CENTRAL THEME:- MEASURES OF DISPERSION

TOPIC:- RANGE AND MEAN DEVIATION

CLASS:- SS2

DURATION:- 80 Minutes

Objectives: At the end of the lesson, the students should be able to:

- define the following:
  (i) measures of dispersion. (ii)range. (iii) mean deviation
- state the formula of calculating the range and mean deviation of a group and ungrouped data.
- solve simple calculations using the formulas.

Previous Knowledge: The students are familiar with determination of mean, median and mode of a group and ungroup data.

Instructional material: Charts and flash cards showing the formula of range and mean deviation.

Reference Books:

1. Essential Mathematics, Book two (senior) by Adeola A. J Oluwasanmi
2. New General Mathematics, Book two (senior) by M . F Macrae et al

Content: Measures of Dispersion:- This shows how items in the data are dispersed or scattered about the mean figure. Statistics or measures of dispersion used to indicate variability of data are: (i)Range (ii) Mean Deviation (iii) Variance (iv) Standard Deviation.

(1) RANGE :- Range is the difference between the highest and the smallest values of a data. It is one of the ways of stating the variability of a data.

Examples:

(1) Find the range of 5, 7, 11, 5, 4, 12, 5

Solution

The highest value = 12

The lowest value = 4

Range = 12 – 4 =8

RANGE OF UNGROUPED FREQUENCY DATA

Find the range of the ungrouped frequency table below

X	0	1	2	3	4	5
F	2	5	6	4	2	1

Solution

The highest value = 5

The lowest value = 0

Range = 5 – 0 = 5

RANGE OF GROUPED FREQUENCY DATA

Find the range of the ungrouped frequency table below

X	1 -10	11 – 20	21 – 30	31 – 40	41 – 50
F	6	8	5	7	10

Solution

The highest value = 50; The lowest value = 1; Range = 50 – 1 = 49

MEAN DEVIATION:- This is the average of the deviation of the observations from the mean where all the deviations are taken as positive.`

MD = $\Sigma \vee X - x \vee \frac{¿}{N} ¿$ where N= Number of items in the data

MEAN DEVIATION OF GROUPED FREQUENCY DATA

MD = $\Sigma f \vee X - x \vee \frac{¿}{N} ¿$ where N= Number of items in the data

Evaluation: Determine the range and mean deviation of the frequency data below

X	1 -10	11 – 20	21 – 30	31 – 40	41 - 50
F	8	10	7	9	12

Assignment: **D**etermine the range and mean deviation of the frequency data below

X	1 -10	11 – 20	21 – 30	31 – 40	41 - 50
F	9	11	8	10	13

NAME OF TEACHER: WHENU, B, S (MR)

SUBJECT:- MATHEMATICS

WEEK: FOUR (4)

CENTRAL THEME:- MEASURES OF DISPERSION

TOPIC:- VARIANCE AND STANDARD DEVIATION

CLASS:- SS2

Duration:- 80 Minutes

Objectives: At the end of the lesson, the students should be able to:

- define the following:
  (i) variance. (ii)standard deviation.
- state the formula of calculating the variance and standard deviation of a group and ungrouped data.
- solve simple calculations using the formulas.

Previous Knowledge: The students are familiar with determination of range and mean deviation of a group and ungroup data.

Instructional material: Charts and flash cards showing the formula of variance and standard deviation.

Reference Books:

i. Essential Mathematics, Book two (senior) by Adeola A. J Oluwasanmi
ii. New General Mathematics, Book two (senior) by M . F Macrae et al

Content: VARIANCE:- This is the mean of the sum of the squared deviation of individual values from the mean of the set of values. Variance gives the spread of data about it's mean.

Variance, $\sigma^2 = \frac{\Sigma(X-x)2}{N}$

Variance of Grouped Frequency Data

Variance, $\sigma^2 = \frac{\Sigma f(X-x)2}{\Sigma f}$

STANDARD DEVIATION

This is a number which gives a measure of the spread of data about its mean figures in the same units as the mean. It is a refined form of the mean deviation.

Standard Deviation of Ungrouped Frequency Data.

Standard deviation, $\sigma = \sqrt{\frac{\Sigma(X-x)2}{N}}$

Standard deviation of Grouped Frequency Data

Standard deviation, $\sigma = \sqrt{\frac{\Sigma f(X-x)2}{\Sigma f}}$

Evaluation: Determine the variance and standard deviation of the frequency data below.

X	1 -10	11 – 20	21 – 30	31 – 40	41 - 50
F	8	10	7	9	12

Assignment: **D**etermine the variance and standard deviation of the frequency data below.

X	1 -10	11 – 20	21 – 30	31 – 40	41 - 50
F	9	11	8	10	13