

SCHEME OF WORK

SUBJECT: Mathematics CLASS: JSS II TERM: 1st

WEEK 1 GENERAL TOPIC: STANDARD FORM OF NUMBERS OF NUMBERS & INDICES

Period 1: Law of indices.
Period 2: Standard Form of Numbers greater than one (Large number).
Period 3: Changing Large numbers to Ordinary Form.
Period 4: Standard Form of Numbers Less than one.
Period 5: Changing Small Numbers to Ordinary Form.
WEEK 2 GENERAL TOPIC: APPROXIMATION.
Period 1: Rounding Numbers to Nearest Ten, Hundred and Thousand.
Period 2: Nearest Tenth, Hundredth and Thousandth.
Period 3: Decimal Places and Whole Numbers.
Period 4: Significant Figures.
Period 5: Basic Operations and Approximation.
WEEK 3 GENERAL TOPIC: FACTORS AND MULTIPLES.
Period 1: Factors of Numbers.
Period 2: Prime Factors of Numbers and Terms.
Period 3: Common Factors of Numbers and Terms.
Period 4: Squares and Square Roots of Numbers.
Period 5: Rules of Divisibility.
WEEK 4 GENERAL TOPIC: DIRECTED NUMBERS.
Period 1: Addition and Subtraction of Directed Numbers.
Period 2: Multiplication of Directed Numbers
Period 3: Division of Directed Numbers.
Period 4: Order of Operations.
Period 5: Problem Solving.
WEEK 5 GENERAL TOPIC: INVERSE AND IDENTITY.
Period 1: Additive Inverse and Identity
Period 2: Solving Equations that involves Additive Inverse.
Period 3: Multiplicative Inverse and Identity.
Period 4: Solving Equations that Involve Multiplicative Inverse.
Period 5: Problem Solving.
WEEK 6 GENERAL TOPIC: SIMPLE EQUATIONS IN ONE VARIABLE.
Period 1: Balance Method.
Period 2: Equations Containing Bracket.
Period 3: Word Problem Involves Balance Method and Equation with Brackets
Period 4: Equation Containing Fractions.
Period 5: Word Problems Involving Equation Containing Fraction.
WEEK 7 GENERAL TOPIC: GRAPH; INTRODUCTION TO CARTESIAN PLANE
Period 1: Introduction to Cartesian Plane.
Period 2: Identifying the x – axes and y – axes.
Period 3: Plotting Points on the Cartesian Plane.
Period 4: Coordinates
Period 5: Constructing Shapes from the Coordinates.

WEEK 8 GENERAL TOPIC: GRAPH; LINEAR – COMPLITING TABLES.

	Period 1: Completing Table of values for Given Equation.
	Period 2: Plotting Points on the graph sheet/paper using table.
	Period 3: Join Linear Graphs.
	Period 4: Examples of Linear Graph.
	Period 5: Problem Solving in Linear Graph.
	WEEK 9 GENERAL TOPIC: LINEAR INEQUALITIES IN ONE VARIABLE.
	Period 1: Signs/Symbols of Inequalities.
	Period 2: Representing Inequalities on a number Line.
	Period 3: Combined Inequalities.
	Period 4: Solving Inequalities.
	Period 5: Word Problems Leading to Inequalities.
	WEEK 10 GENERAL TOPIC: REVISION.
	Period 1:
	Period 2:
	Period 3:
	Period 4:
	Period 5:
	WEEK 11 GENERAL TOPIC: EXAMINATION.
	Period 1:
	Period 2:
	Period 3:
	Period 4:
	Period 5:
	WEEK 12 GENERAL TOPIC:
	Period 1:
	Period 2:
	Period 3:
	Period 4:
	Period 5:

WEEK OF THE TERM: 1

CLASS: JSS 2

SUBJECT: Mathematics

GENERAL TOPIC: Standard Form and Law of Indices.

SPECIFIC TOPIC: Laws of Indices.

PERIOD: 1

LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to:

- (i) Identify and explain the Laws of indices.
- (ii) Apply law 1 in solving indices.
- (iii) Apply law 2 in expressing law of indices.
- (iv) Combine the two laws at the same time in solving indices.

LEARNING RESOURCES:

Abacus, use of projector in teaching and videos of laws of indices.

REFERENCE MATERIALS

New General mathematics for JSS, Book 2.

New concept mathematics for JSS, Book 2.

Essential mathematics for JSS Book 2.

PRE-REQUISITE KNOWLEDGE:

The learners have done index numbers in their previous class.

CHALKBOARD SUMMARY:

Laws of Indices:

Multiplication Law 1:

Simplify this expression by fully expanding the terms;

$$\begin{aligned} 1. \quad & n^5 \times n^4 \\ & = n^{5+4} \\ & = n^9 \end{aligned}$$

$$\begin{aligned} 2. \quad & 3a^2 \times 8a^4 \\ & = 3 \times 8 \times a^{2+4} \\ & = 24 \times a^6 \\ & = 24a^6 \end{aligned}$$

$$\begin{aligned} 3. \quad & y \times y^7 \\ & = y^1 \times y^7 \\ & = y^{1+7} \\ & = y^8 \end{aligned}$$

Division Law 2;

$$\begin{aligned} 1. \quad & x^5 \div x^3 \\ & = x^{5-3} \\ & = x^2 \end{aligned}$$

$$\begin{aligned} 2. \quad & 12m^8 \div 4m^5 \\ & = 12m^{8-5} \\ & = 12/4m^3 \end{aligned}$$

	$= 3m^3$
	3. $c^4 \div c$
	$= c^{4-1}$
	$= c^3$
	Zero and Negative x^0 and x^{-a}
	1. 10^{-4}
	$(1/10)^4$
	$1/10000 = 0.0001$ ans.
	2. $(1/3)^{-2}$ 4. $m^0 \times n^0 = 1 \times 1 = 1$ ans.
	3. $(1/4)^{-3}$

ASSIGNMENT

Simplify the following:

1. $g^{17} \times g^{11}$

2. $21p^3 \times 3p^9$

3. $K^3 \times k^7$

4. $\frac{24x^8}{6x^3}$

5. $42y^{12} \times 6y^5$

6. $P^2 \times p^5 \times p^{-3}$

WEEK OF THE TERM: 1

CLASS: Jss 2

SUBJECT: Mathematics

GENERAL TOPIC: Standard form of numbers and Indices. **s**

SPECIFIC TOPIC: Standard form of numbers greater than 1.

PERIOD: 2

LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to:

(i) State the formula for standard form of numbers greater than 1.

(ii) Representing the numbers in powers of ten.

(iii) Combine other numbers that are not only zeros at the back.

(iv) Solving more question.

LEARNING RESOURCES:

1. Chart and Abacus 2. Use of Projector 3. Videos of Standard form of number greater than one.

REFERENCE MATERIALS

New concept mathematics for JSS, Book 2.

Essential mathematics for JSS, Book 2.

New General mathematics for JSS, Book 2.

CHALKBOARD SUMMARY:

Standard form of large numbers.

Standard form is a way of writing down very large numbers easily. $10^3 = 10 \times 10 \times 10$ $10^3 = 1000$,

So, $4 \times 10^3 = 4 \times 1000 = 4000$. Therefore $400 = 4 \times 10^2$. This idea can be used to write every large numbers.

Standard form (also called **scientific notation**) is a way of writing very large or very small numbers in a shorter form.

For **numbers greater than 1**, the standard form is:

$$a \times 10^n$$

Imagine You Are a Superhero!

Think of the decimal point as a **tiny superhero** that can move left or right.

For **numbers greater than 1**, the superhero's mission is to **move to the left** until only **one digit** is left in front of it.

Every step the superhero takes earns **1 power of 10!**

Express the following numbers in standard form;

1. 7000 000

$$= 7 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10$$

$$= 7 \times 10^6$$

2. 24 000 000 000

$$= 2.4 \times 10^{10}$$

$$= 24\,000\,000\,000$$

3. 934 000

$$= 9.34 \times 10^5$$

4. 1245.6

$$= 1.2456 \times 10^3$$

ASSIGNMENT

Express the following in standard form;

1. 200

2. 46

3. 64 000 000

4. 2 078 000

5. 489.5

6. Express the following in standard form;

7. 42 000

b. 339.6

WEEK OF THE TERM: 1

CLASS: JSS 2

SUBJECT: Mathematics

GENERAL TOPIC: Standard form of numbers and Indices s

SPECIFIC TOPIC: Changing Standard form of large numbers to Ordinary form.

PERIOD: 3

LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to:

(i) Identify standard form of large numbers.

- (ii) Express standard form to ordinary form.
- (iii) Differentiate standard form and ordinary form.
- (iv) Solve more questions.

LEARNING RESOURCES:

1. Chart and abacus
2. Projector
3. Video

REFERENCE MATERIALS

- Essential mathematics for JSS Book 2.
- New General mathematics for JSS Book 2.

CHALKBOARD SUMMARY:

Change these numbers from standard form to ordinary form.

1. $8 \times 10^3 = 8\,000$ Ans.
2. $2.5 \times 10^6 = 2\,500\,000$ Ans.
3. $4.03 \times 10^7 = 40\,300\,000$ Ans.
4. $7.451 \times 10^2 = 745.1$ Ans.
5. $6.2 \times 10^0 = 6.2 \times 1 = 6.2$ Ans.
6. $2.7827 \times 10^3 = 2\,782.7$ Ans.
7. $8.91 \times 10^4 = 8\,910$ Ans.
8. $7 \times 10^9 = 7\,000\,000\,000$ Ans.

ASSIGNMENT

Change the following from standard form to ordinary form.

1. 4×10^2
2. 3×10^4
3. 8.4×10^8
4. 7.37×10^7
5. Express the following standard form to ordinary form.
6. 5.1×10^7
5. 3.106×10^8
6. 9.37×10^7
- b. 3.52×10^4

WEEK OF THE TERM: 1

CLASS: JSS 2

SUBJECT: Mathematics

GENERAL TOPIC: Standard form and Indices

SPECIFIC TOPIC: Standard form of numbers less than one

LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to:

- (i) Identify those numbers less than one.
- (ii) Express those numbers to powers of ten.
- (iii) Apply standard form of numbers less than one.
- (iv) Solve more questions.

LEARNING RESOURCES:

1. Abacus. 2. Use of projector 3. Video

CHALKBOARD SUMMARY:

Standard form of numbers less than 1:

Definition: A decimal number is a number with one or more digits to the right of the decimal point. A decimal number is a number with decimal point eg 0.007, 0.037 etc.

Express decimal numbers in standard form.

1. 0.005

$$= 5 \times 10^{-3}$$

2. 0.27

$$= 2.7 \times 10^{-1}$$

3. 0.0004

$$= 4 \times 10^{-4}$$

4. 0.000 000 401

$$= 4.01 \times 10^{-7}$$

5. 0.000 781

$$= 7.81 \times 10^{-4}$$

6. 0,06031

$$= 6.031 \times 10^{-2}$$

7. 0.000 000 532

$$= 5.32 \times 10^{-7}$$

ASSIGNMENT

Express the following numbers in standard:

a. 0.0072

d. 0.0 000 621

b. 0.000 795

e. 0.00 409

c. 0.52

f. 0.00 000 051

Solve each inequality and sketch a

d. Express the following in standard form;

1. 0.0017

2. 0.000 326

WEEK OF THE TERM: 1**CLASS:** JSS 2**SUBJECT:** Mathematics**GENERAL TOPIC:** Standard form of numbers/law of indices**SPECIFIC TOPIC:** Change standard form of small numbers back to ordinary form**LEARNING OBJECTIVES:** By the end of the lesson, the learners should be able to:

- (i) Identify the standard form of numbers less than 1.
- (ii) Express the standard form back to ordinary form.
- (iii) Differentiate standard form of whole numbers from small numbers.
- (iv) Solve more question.

LEARNING RESOURCES:

- 1. Abacus. 2. Projector 3. Video

REFERENCE MATERIALS

- Essential mathematics for JSS Book 2.
- New General mathematics for JSS Book 2.

CHALKBOARD SUMMARY:**Change standard form back to ordinary form.**

Example:

Express the following numbers written in standard form as decimal fraction;

$$\begin{aligned}
 1. \quad & 2.3 \times 10^{-3} \\
 & = 2.3 \times 0.001 \\
 & = 0.0023 \text{ Ans}
 \end{aligned}$$

$$\begin{aligned}
 2. \quad & 7.3 \times 10^{-7} \\
 & = 7.3 \times 0.000\,000\,1 \\
 & = 0.00\,000\,073 \text{ Ans.}
 \end{aligned}$$

$$\begin{aligned}
 3. \quad & 4.589 \times 10^{-8} \\
 & = 4\,589 \times 0.00\,000\,001 \\
 & = 0.00\,000\,004\,589 \text{ Ans.}
 \end{aligned}$$

$$\begin{aligned}
 4. \quad & 1.8 \times 10^{-1} \\
 & = 1.8 \times 0.1 \\
 & = 0.18 \text{ Ans.}
 \end{aligned}$$

$$\begin{aligned}
 5. \quad & 6.98 \times 10^{-2} \\
 & = 6.98 \times 0.01 \\
 & = 0.0\,689 \text{ Ans.}
 \end{aligned}$$

6.	9.4×10^{-4}
	$= 9.4 \times 0.0001$
	$= 0.00094$ Ans.

ASSIGNMENT

(1) If 7.3 is subtracted from y , the result is less than 3.4.

Find the range of values of y .

(2) Five times a whole number, x , is subtracted from 62. The result is less than 40

Find the three lowest values of x .

(3) A man gets a monthly salary of x . His rent per month is N8,000.

After paying his rent, he is left with less than N20,000. Find the range of values of x

(4) A triangle has a base of 6cm and an area of less than 12cm².

What can we say about its height?

WEEK OF THE TERM: 2

CLASS: JSS 2

SUBJECT: Mathematics

GENERAL TOPIC: Approximation.

SPECIFIC TOPIC: Rounding numbers to the nearest Ten, Hundred and Thousand

LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to:

- (i) Identify numbers in their digits.
- (ii) round numbers to the nearest Tens.
- (iii) Round numbers to the nearest hundreds
- (iv) Round numbers to the nearest Thousands.

LEARNING RESOURCES:

1. Rounding off numbers flow chart.
2. Use of Projector
3. Video

REFERENCE MATERIALS

- New Concept mathematics for JSS Book 2.
- New essential mathematics for JSS Book 2.

CHALKBOARD SUMMARY:

Rounding Numbers to the Nearest Ten, Hundred and Thousand:

Round the following to the nearest (i) Ten (ii) Hundred (iii) Thousand

3	4	5	7	8
Tth	Th	H	T	U

SPECIFIC TOPIC: Rounding off number to nearest tenth, hundred, thousand

LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to:

- (i) Identify the place value system
- (ii) Round number to the nearest tenth
- (iii) Round number to the nearest hundred
- (iv) Round number to the nearest thousand

LEARNING RESOURCES:

1. Rounding off number chart
2. Use of projector.

REFERENCE MATERIALS

- New Concept mathematics for JSS Book 2.
- New General mathematics for JSS, Book 2
- New essential mathematics for JSS Book 2.

CHALKBOARD SUMMARY:

Round off number to the nearest tenths, hundreds, thousands.

3 7 2 4 9

Whole	Tenths	Hundreds	Thousands	Ten thousands.
Number				

1 Round of number to the (i) tenths (ii) hundred (iii) thousands

34.8463

34.8463 34.8 to nearest tenths

34.8463 34.85 to nearest hundreds

34.8463 s 34.846 to nearest thousands.

Calculate his (i) loss or profit (ii) Percentage profit or loss.

NUMBER	WHOLE	TENTH	HUNDREDTH
--------	-------	-------	-----------

NUMBER

2.5177	3	2.5	2.52 sss
--------	---	-----	----------

0.9456	0.9	0.95	0.946
--------	-----	------	-------

9.5087	9.5	9.51	9.509
--------	-----	------	-------

15.6677	16	15.7	15.67
---------	----	------	-------

0.0466	0	0.0	0.05
--------	---	-----	------

10.5437	11	10.5	10.54
---------	----	------	-------

25.3965	25	25.4	25.40
---------	----	------	-------

12.6005 13 12.6 12.60
ASSIGNMENT
Approximate the following to the nearest (i) whole number (ii) tenths (iii) hundredths.
a. 0.006333378
b. 120.5409
c. 0.8178
d. 657.9356
Approximation the following to the (i) whole (ii) tenths (iii) hundredths
10.00169 b. 13.8366

WEEK OF THE TERM: 2

CLASS: JS 2

SUBJECT: Mathematics

GENERAL TOPIC: Approximation.

SPECIFIC TOPIC: Round off Number to The Nearest Decimals/ whole numbers.

LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to:

- (i) Identify decimal numbers and their place values.
- (ii) Express the numbers to the nearest one decimal.
- (iii) Express the numbers to the nearest two decimal.
- (iv) Apply the method and solve four decimal places.

LEARNING RESOURCES:

1. The teacher brings some biros, rulers and books to the class for demonstration.
2. Use of Projector.

REFERENCE MATERIALS

- New Concept mathematics for JSS Book 2.
- New Essential mathematics for JSS Book 2.

CHALKBOARD SUMMARY:

Rounding off Numbers To Nearest Decimals.

3 . 7 2 4 9

Whole	1 decimal	2 decimals	3 decimals	4 decimals
Number				

1. Round off numbers to the (i) 1 decimal (ii) 2 decimals (iii) 3 decimals

34.8463

Solution:			
$34.8463 \cong 8$ to 1 decimal place.			
$34.8463 \cong 34.85$ to 2 decimal places.			
$34.8463 \cong 34.846$ to 3 decimal places.			
Number	1d.p	2 d.p	3 d.p
2.5177	2.5	2.52	2.518
0.9456	0.9	0.95	0.946
0.0466	0.0	0.05	0.047
12.6005	12.6	12.60	12.601
25.3965	25.4	25.40	25.397

ASSIGNMENT	
Approximate the following to the nearest (i) 1 d.p (ii) 2 d.p 3 d.p	
1. 0.006378	
2. 120.5409	
3. 0.8178	
4. 657.9356	
Approximate the following to the (i) 1 d.p (ii) 2 d.p (iii) 3 d.p	
10.00169	b. 13.8366

WEEK OF THE TERM: <u>2</u>
CLASS: <u>JS 2</u>
SUBJECT: <u>Mathematics</u>
GENERAL TOPIC: <u>Approximation</u>
SPECIFIC TOPIC: <u>Significant figure</u>
LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to:
(i) Identify the place value system,
(ii) Round numbers to the nearest 1 significant figure.
(iii) Round numbers to the nearest 2 significant figures.
(iv) Round numbers to the nearest 3 significant figures.
LEARNING RESOURCES:
1. Abacus
2. Use of Projector.
REFERENCE MATERIALS
- New Concept mathematics for JSS Book2.

- New General Mathematics for JSS Book 2.
- New essential mathematics for JSS Book 2.

CHALKBOARD SUMMARY:

Significant figures:

There are three categories of numbers:

1. One with whole number.
2. One is Decimal number.
3. Another one with zero at the front.

1. Approximately the following to the nearest (i) 1 S.F (ii) 2 S.F (iii) 3 S.F

a. $7284 \cong 7000$ to 1 S. F

b. $7284 \cong 7300$ to 2 S. F

c. $7284 \cong 7280$ to 3 S. F

6.0784

a. $6.0784 \cong 6.1$ to 1 S. F

b. $6.0784 \cong 6.08$ to 2 S. F

c. $6.0784 \cong 6.078$ to 3 S.F

0.004586

a. $0.004586 \cong 0.005$

b. $0.004586 \cong 0.0046$

c. $0.004586 \cong 0.00459$

Learners' Activities:

The learners copy the corrections of the evaluation exercise where they fail.

They also ask questions where they still find difficult.

ASSIGNMENT

- (1) Approximate the following to the nearest (i) 1s.f (ii) 2s.f (iii) 3s.f

a. 0.006378

b. 120.5409

c. 9956

d. 9956

Approximate the following to the (i) 1 S.F (ii) 2 S.F (iii) 3 S.F

3590

b. 17 369

c. 0.0005477

WEEK OF THE TERM: 3

CLASS: JSS 2

SUBJECT: Mathematics

GENERAL TOPIC: Factors and Multiples

SPECIFIC TOPIC: Factors/ Prime factors

LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to:

- (i) Define factors of a number.
- (ii) Give all factors of a given number.
- (iii) Explain the relationship between prime factors and prime numbers.
- (iv) Express a number as a product of its prime factors

LEARNING RESOURCES:

Chart of prime numbers and factors.

REFERENCE MATERIALS

- New Concept mathematics for JSS Book 2.
- New General Mathematics for JSS Book 2.
- Essential mathematics for JSS Book 2.

CHALKBOARD SUMMARY:

Factors

A factor or any number is the whole number that divide the number exactly without remainder.

if $2 \times 3 = 6$, then 2 and the 3 are factors of 6 because $6 \div 2 = 3$ and $6 \div 3 = 2$.

The factors of 30 are 1, 2, 3, 5, 6, 15 and 30.

Generally, 1 is a factor of any number and a number is a factor of itself.

Example:1

Find all the factor of

- a. 18
- b. 25
- c. 100

A prime is any number that has two number, itself and 1.e.g
2,3,5,7,11,13,17,19,23,29,31,37,41,43,47,53,59,61,67,71,73,79,83,89,91,97, etc.

Example:2

- a. What is the prime number between 20 and 50
- b. Write all the prime numbers from 70 to 100
- c. Express 24 as a product or its prime factors
- d. Which of the factors of 24 are prime

2 (a) prime factor from 70 to 100 are: 71, 73, 79, 83,

Prime factors are factors of a number that can divide a whole number without remainder but prime numbers.

State which of the following factors are prime numbers.

	a. 42
	b. 30
	c. 63
	d. 72

	ASSIGNMENT
	(1) For each number (a) Write down all its factors. (b) State which factors are prime number
	(c) express the numbers in index form.
	(i) 28 (ii) 33 (iii) 450
	2. Find the prime factors of the following:
	a. 16
	b. 28
	Express 50 as a product of its prime factors in index form.
	Write all the prime numbers from 51 to 100.

WEEK OF THE TERM: 3

CLASS: JSS 2

SUBJECT: Mathematics

GENERAL TOPIC: Factors and Multiples

SPECIFIC TOPIC: Common factors and H.C.F

LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to:

- (i) Identify common factors,
- (ii) Use common factors to solve HCF,
- (iii) Calculate the HCF of a given number,
- (iv) Differentiate common factors and HCF.

LEARNING RESOURCES:

Use of Projector and video.

REFERENCE MATERIALS

- New Concept mathematics for JSS Book 2.
- New General Mathematics for JSS Book 2
- New essential mathematics for JSS Book 2.

CHALKBOARD SUMMARY:

Common Factors:

Two or more numbers have some of their factors that are the same. E.g the factors of 24 are 1,2,3,4,6,8,12 and 24 while the factors of 30 are 1,2,3,5,6,10,15, and 30. The common factors of 24 and 30 are 1,2,3 and 6.

Highest Common Factors (HCF)

The HCF of more numbers are the largest factor, common to the given numbers, e.g. the common factor of 24 and 30 are 1,2,3, and 6, out of these, the highest or largest of them in value is 6, therefore 6 is called the HCF of 24 and 30.

Examples

Find the HCF of each of the following sets of numbers;

- (1) $2 \times 2 \times 3 \times 5 \times 7$ and $2 \times 2 \times 2 \times 2 \times 7$
- (2) 10 and 25
- (3) 32 and 48
- (4) 60 160 and 200

Solutions

$2 \times 2 \times 3 \times 5 \times 7$

$2 \times 2 \times 2 \times 2 \times 7$

HCF = $2 \times 2 \times 7$

= 28 Ans.

(2) 5 10 5
 2 1

HCF = 5 Ans.

	(3)	2	32
		2	16
		2	8
		2	4
		2	2
			3
	HCF = 2 x 2 x 2 x 2		
	= 16 Ans.		
	(4)	2	60
			160

Learners' Activities:

The learners do the evaluation exercise given above.

CONCLUSION (INDIVIDUAL AND GROUP)

Teacher's Activities:

The teacher hears/takes questions arising from the learners.

Learners' Activities:

The learners are questions on the lesson taught.

ASSIGNMENT

Calculate the HCF of each of the following

(1) 6 and 8

(2) $2 \times 2 \times 3 \times 5 \times 5$; $2 \times 2 \times 3 \times 7$

(3) 36 and 81

(4) 9, 27 and 12

Find the common factors of 20 and 50

What is the HCF of 20 and 50

Which of the following is not a common factor of 20 and 50

2, 50, 25, 20, 10, 4, 5, 3

WEEK OF THE TERM: 3

CLASS: JSS 2

SUBJECT: Mathematics

GENERAL TOPIC: Factors and Multiples

SPECIFIC TOPIC: Rules for Divisibility

LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to:

- (1) Identify the rules for divisibility,
- (2) State the rules without looking at anywhere,
- (3) Apply the rules in solving mathematical work,
- (4) Solve questions using the rules.

LEARNING RESOURCES:

Chart of the rules for divisibility, use of projector and video.

REFERENCE MATERIALS

- New Concept mathematics for JSS Book 2.
- New General Mathematics for JSS Book 2
- Essential mathematics for JSS Book 2.

CHALKBOARD SUMMARY:

RULES OF DIVISIBILITY

Any whole number is exactly divisible by

2 if its last digit is even or 0

3 if the sum of the digits is divisible by 3

4 if its two digits form a number divisible by 4

5 if its last digits is 5 or 0

6 if its last digit is even and the sum of its digits is divisible by 4

7 there is no specific rule for 7 to divide a number

8 if its last three digits form a number divisible by 8

9 if some of its digits are divisible by 9

10 its last digit is 0.

11 for 11 to divide a number, add odd position and even position of the values of the number you want to Divide, if the result is 0 or double number, it is divisible by 11.

(a) There is no easy rule for divisibility by 7.

(b) If a number divisibly by 6 is also divisibly by 2 and 3. Since $2 \times 3 = 6$

(c) If a number by 2 or more numbers, then it is also divisible by the LCM of the numbers e.g A number divisible by 9, 15 and 4, should also be divisible by the LCM of 9, 15 and 4 which is 180.

Examples

(1) Which of the following numbers are exactly divisible by 9?

(2) Which of the numbers 5, 6 and 8 are divisible by 2328?

(3) Copy and complete the following table: the first one has been done for you.

Divisors									
Number	2	3	4	5	6	8	9	10	

(a) 1354

(b) 32550

(c) 83241

(d) 2005

Squares and square roots

If $a \times a = a^2$, then $\sqrt{a^2} = a$ e.g $9 \times 9 = \sqrt{81} = 9$.

Example:

(1) Find the square root of the following by factor method

(a) 6400 (b) 225 (c) 2025 (d) $\frac{4}{25}$ (e) $\frac{27}{48}$ (f) $2\frac{1}{4}$

(2) Find the smallest number that can be multiplied by each of the following so that their products are Perfect squares.

(a) 540 (b) $2 \times 2 \times 2 \times 3 \times 5$ (c) $2^3 \times 7^2 \times 11^5$ (d) 24

ASSIGNMENT

(1) Copy and complete the table below by marking good or x against numbers divisible by each of the Given numbers.

Number	2	3	4	5	6	8	9	10
--------	---	---	---	---	---	---	---	----

2005								
------	--	--	--	--	--	--	--	--

3240								
------	--	--	--	--	--	--	--	--

6328								
------	--	--	--	--	--	--	--	--

Find all the numbers from 2 to 10 that are divisible by
4770 (b) 435 (c) 360

WEEK OF THE TERM: 3

CLASS: JSS 2

SUBJECT: Mathematics

GENERAL TOPIC: Factors and Multiples

SPECIFIC TOPIC: Multiples and Common Multiples

LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to:

- (i) Identify multiples of given numbers,
- (ii) Express the common factors,
- (iii) Solve the lowest common multiples (LCM),
- (iv) Differentiate common factors and Multiples.

LEARNING RESOURCES:

Mathematics kit, Projector and video.

REFERENCE MATERIALS

- New Concept mathematics for JSS2 Book 2.
- New General Mathematics for JSS 2Book 2
- New essential mathematics for JSS2 Book 2.

CHALKBOARD SUMMARY:

MULTIPLES AND COMMON MULTIPLES:

Find the five multiples of (a) 2 (b) 3 (c) 5 as follows:

$$2 = 2 \times 1 = 2$$

$$2 = 2 \times 2 = 4$$

$$2 = 2 \times 3 = 6$$

$$2 = 2 \times 4 = 8$$

$$2 = 2 \times 5 = 10$$

Therefore, 2, 4, 6, 8, 10 etc

$$3 \times 1 = 3$$

$$3 \times 2 = 6$$

$$3 \times 3 = 9$$

$$3 \times 4 = 12$$

$$3 \times 5 = 15$$

Therefore, 3, 6, 9, 12, 15 etc.

Find the lowest common multiples of the following:

1. 20 and 24

$$2 \quad 20 \quad 24$$

$$2 \quad 10 \quad 12$$

$$2 \quad 5 \quad 6$$

$$2 \quad 5 \quad 3$$

$$3 \quad 5 \quad 1$$

$$5 \quad 1 \quad 1$$

$$\text{LCM} = 2 \times 2 \times 2 \times 2 \times 3 \times 5$$

$$= 240$$

ASSIGNMENT

1. Find the first five multiples of 7

2. Find the LCM of the following:

a. 35, 45 and 60

b. 20, 28 and 35

Find the LCM of 6, 10 and 18

Find the LCM of 12, 16 and 28

WEEK OF THE TERM: 3

CLASS: JSS 2

SUBJECT: Mathematics

GENERAL TOPIC: Factors and Multiples.

SPECIFIC TOPIC: Square and Square Root.

LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to:

(i) Identify the squares and square roots.

(ii) Apply factor method of finding square root.

(iii) Calculate perfect squares.

(iv) Evaluate square root by giving more questions to solve in the class.

LEARNING RESOURCES:

Chart, projector.

REFERENCE MATERIALS

- New Concept mathematics for JSS Book 2.
- New essential mathematics for JSS Book 2.

CHALKBOARD SUMMARY: square and square roots.

Square; any number raised to the power of two.

Examples

$3^2, 7^2, 6^2$ etc.

Square Roots; Any number that is under the symbol $\sqrt{\quad}$ is a square root number.

Find by the factor method the square roots of these numbers;

a. 729

Solution;

3 729

3 243

3 81

3 27

3 9

3 3

1

Group the product in twos since is square root

$3 \times 3 \times 3 = 27$ Ans.

b. 1764

2 1764

2 882

3 441

3 147

7 49

7 7

1

Group in twos = $2 \times 3 \times 7$

= 42 Ans.

Perfect squares;

$1 \times 1 = 1$

$2 \times 2 = 4$

$3 \times 3 = 9$

$4 \times 4 = 16$

$5 \times 5 = 25$

$6 \times 6 = 36$

7 x 7 = 49
8 x 8 = 64
9 x 9 = 81
Find the perfect number 10 to 20.
10 x 10 = 100
ASSIGNMENT
(1) Find the smallest number by which this must be multiply so that their product are perfect squares;
a. 24 b. 45 c. 99 d. 162
(2) Evaluate the following;
a. $(0.7)^2$ b. $\sqrt{64} \times 9$ c. $\sqrt{(16)} \times 25 \times 100$.

WEEK OF THE TERM: 4

CLASS: JSS 2

SUBJECT: Mathematics

GENERAL TOPIC: Directed Number

SPECIFIC TOPIC: Addition Of Directed Numbers.

LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to:

- (i) Define directed numbers.
- (ii) Draw the number line
- (iii) Use the number line to explain addition of numbers.
- (v) Solve the addition of the directed numbers.

LEARNING RESOURCES:

Chart of number line.

REFERENCE MATERIALS

- New General Mathematics for JSS, Book 2
- New essential mathematics for JSS Book 2.
- Essential mathematics for JSS Book 2.

CHALKBOARD SUMMARY: Addition of directed number

Evaluate the following using number line;

1. $(+2) + (+4) =$

-2 -1 0 1 2 3 4 5 6 7 8 9

$2 + 3 + 2 =$

-2 -1 0 1 2 3 4 5 6 7

$3 + 4 + 3 =$

-2 -1 0 1 2 3 4 5 6 7 8 9

Evaluate the followings;

a. $+5 + 4 = +9$

b. $-5 - 4 = -9$

ASSIGNMENT

Evaluate each of the following and simplify where possible.

(1) $2 + (-11)$

(2) $-17 + 13$

(3) $(+15) + (-14)$

(4) $15 - (-9) + 12$

Evaluate the following:

a. $(-4) - (+7)$

b. $(+5) + (-8)$

WEEK OF THE TERM: 4

CLASS: JSS 2

SUBJECT: Mathematics

GENERAL TOPIC: Directed Numbers.

SPECIFIC TOPIC: Subtraction of direct numbers.

LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to:

- (i) Define directed numbers,
- (ii) Draw the number line,
- (iii) Use the diagram to show how to calculate using number lines,
- (iv) Solve using number line,

LEARNING RESOURCES:

Chart of number line and Use of Projector.

REFERENCE MATERIALS

- New General Mathematics for JSS, Book 2
- New essential Mathematics for JSS Book 2.

CHALKBOARD SUMMARY:**Subtraction of Directed numbers:**

Evaluate the following using number line;

1. $(+2) + (-4)$

2. $-3 - 2 =$

$$3. \quad +4 + 3 =$$

Evaluate the following:

$$a. \quad -5 - 4 = -9$$

$$b. \quad -5 - 3 =$$

$$c. \quad +5 - 4 =$$

$$d. \quad -5 + 4 =$$

Evaluate the following:

$$\begin{aligned} 1. \quad & (+6) - (+7) \\ & = +6 - 7 \\ & = -1 \end{aligned}$$

$$\begin{aligned} 2. \quad & (-5) - (+5) \\ & = -4 + 3 \\ & = -1 \end{aligned}$$

$$3. \quad (-4) - (-3)$$

$$4. \quad 0 - (-8)$$

ASSIGNMENT

Evaluate each of the following and then simplify where possible,

$$1. \quad 4 + (-10)$$

$$2. \quad -34 + 13$$

$$3. \quad (+15) + (-14)$$

$$4. \quad 10 - (-9) + 12$$

Draw the number lines of the following:

$$1. \quad -2 + 5$$

$$2. \quad (4) + (-3)$$

WEEK OF THE TERM: 4

CLASS: JSS 2

SUBJECT: Mathematics

GENERAL TOPIC: Directed Number.

SPECIFIC TOPIC: Multiplication Of Directed Numbers.

LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to:

(i) Identify the sign of multiplication.

(ii) Draw the number lines.

(iii) Apply multiplication in solving directed numbers.

(iv) differentiate sign of multiplication and addition.

LEARNING RESOURCES:

Number line chart.

REFERENCE MATERIALS

- New Concept Mathematics for JSS Book 2
- Essential Mathematic for JSS Book 2
- New General Mathematics for JSS, Book 2

CHALKBOARD SUMMARY:

Multiplication Of Directed Numbers:

Signs of multiplication;

$$+ \times + = +$$

$$- \times - = +$$

$$+ \times - = -$$

$$- \times + = -$$

Application of those signs;

$$+7 \times (+3) = +21$$

$$-7 \times (-3) = +21$$

$$+7 \times (-3) = -21$$

$$-7 \times (+3) = -21$$

1. Find the next four terms of the following:

a. +50, +45, +40, +35, , , , ,

$$b. +4 \times (-6) = -24$$

$$+5 \times (-7) = -35$$

$$+6 \times (-8) = -48$$

$$+7 \times (-9) = -63$$

2. Simplify the following:

a. $(+8) \times (-3) = -24$

b. $(-17) \times (5) = -48$

c. $(-3) \times (-8) \times (-2) = -48$

d. $(-3/4) \times (+8/9)$

e. $(-8.1) \times (0.3)$

ASSIGNMENT

1. $5 \times (-2)$

2. $(-4) \times (+7)$

3. -25×30

4. $-4 \times (-3) \times (-4) \times (+5) \times (-2)$

Simplify the following:

(1) $(-6) \times (+9)$ (2) $(-9) \times 0 \times 2$

WEEK OF THE TERM: 4

CLASS: JSS 2

SUBJECT: Mathematics

GENERAL TOPIC: Directed Numbers.

SPECIFIC TOPIC: Division of Directed Numbers.

LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to:

(i) identify division in directed number.

(ii) divide using signs tables.

(iii) divide two or more directed numbers.

(iv) solve more problem.

LEARNING RESOURCES:

Number line chart and use of projector.

Chart on quantitative reasoning on directed number.

REFERENCE MATERIALS

- New Concept Mathematics for JSS Book 2

- New General Mathematics for JSS Book 2

CHALKBOARD SUMMARY:

(1) work out the following

(a) $(-32)/4 = -8$

(b) $(-48)/(-6) = +8$

(c) $(+32)/(+4) = +8$

(d) $108/(-9) = -12$

(2) Simplify the following:

(a) $(3 \times 5 \times 2 \times 15 \times (-9))/(-5 \times 25 \times 3)$

$= (-4050)/375$

$= -10.8$

(b) $(-6 \times (-3) \times (-8) \times 20)/(-4 \times (-12) \times (-5))$

$= (-2880)/(-240)$

$= -20$

(c) $(-8 \times (-11) \times 9 \times (-5))/(2 \times (-33) \times (-30))$

(d) $(-15 \times 12 \times (-5) \times (-2))/((-2) \times (-3) \times (-10) \times (-4))$

$= (-1800)/(+240)$

$= -7.5$

ASSIGNMENT

(a) $36/((-2) \times (-3))$

(b) $(-28 \times (-3))/21$

(2) $4 + (-14) \div (-3 - 2) \times (-1)$

(1) Find the of the following:

(a) $63 \div (+3)$ (b) $250 \div (-10)$

(2) Simplify the following: (a) $((-3) \times (-7) \times (+8))/((-2) \times (6)) = (-168)/(-12) = -14$

WEEK OF THE TERM: 4**CLASS:** JSS 2**SUBJECT:** Mathematics**GENERAL TOPIC:** Directed Numbers.**SPECIFIC TOPIC:** Combine Operations.**LEARNING OBJECTIVES:** By the end of the lesson, the learners should be able to:

(i) identify negative and positive numbers,

(ii) draw the combination on a number line,

(iii) use BODMAS to solve directed numbers,

(iv) apply the combinations of the operation in solving directed numbers,

LEARNING RESOURCES:

Number line chart, use of Projector and video.

REFERENCE MATERIALS

- New Concept Mathematics for JSS Book 2
- New General Mathematics for JSS, Book 2
- Essential Mathematics for JSS, Book 2

CHALKBOARD SUMMARY:**Combine Operations:**

To work out problems involving combined operations, apply BODMAS rule.

Work out the following:

1. $6 + 5 \times 3$

$= 5 \times 3$

$= 15 + 6$

$= 21 \text{ Ans.}$

2. $(+7) + (+5) \times (+3)$

$= 5 \times 3$

$= 15 + 7$

$= 22 \text{ Ans}$

3. $8 + (5 + 3) \times 2$

	$= 8 + 8 \times 2$
	$= 16 + 8$
	$= 24$ Ans
	4. $8 - 18 \div 6 + 4 \times (-3)$
	$= 8 - 3 + 4 \times (-3)$
	$= 8 - 3 - 12$
	$= 8 - 15$
	$= -7$ Ans
	5. $16 \div (3 + 1) + (-7 \times 3) + 3(6 - 8)$
	$= 16 \div 4 - 4 - 6$
	$= 4 - 10$
	$= -6$ Ans
	6. $32 \div 4 - 2(3 - 5) \div 2$
	$= 8 + 2$
	$= 10$ Ans

	ASSIGNMENT
	Work out the following:
	1. $8(3 - 4) + (-60 - 4) \div (-8)$
	2. $(-1) \times (-1 - 3) \div 5 + (-10)$
	3. $-18 - 34 + 27 + 4$
	Work out the following: $5 - (-15) \times -44 \div (-11)$

	WEEK OF THE TERM: <u>5</u>
	CLASS: <u>JSS 2</u>
	SUBJECT: <u>Mathematics</u>
	GENERAL TOPIC: <u>Inverse/Identity.</u>
	SPECIFIC TOPIC: <u>Additive inverse and identity.</u>
	LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to:
	(i) identify the inverse of each number,
	(ii) put numbers in a table and find the additive inverse,
	(ii) work out the additive inverse of the numbers,
	(iv) solve more questions.
	LEARNING RESOURCES:
	Chart of inverse and identity and projector.

REFERENCE MATERIALS

- New General Mathematics for JSS, Book 2
- New essential Mathematics for JSS Book 2.

CHALKBOARD SUMMARY:

Additive Inverse.

Additive inverse and identity are when 0 is added to any number the result is equal to the given number.

Example; $8 + 0 = 8$

$$0 + 28 = 28$$

Therefore 0 is said to be identify for addition.

When the sum of two numbers is equal to 0 then the two numbers are additive inverse.

$$+6 + (-6) = 6 - 6 = 0$$

$$-6 + (+6) = -6 + = 0$$

Write down the additive inverse of these numbers;

$$+9 \qquad \qquad \qquad -9$$

$$-6 \qquad \qquad \qquad -6$$

$$+15 \qquad \qquad \qquad -15$$

$$+3/(4) \qquad \qquad \qquad - 3/4$$

$$0.45 \qquad \qquad \qquad -0.45$$

$$-8 \times 10^{-4} \qquad \qquad \qquad +8 \times 10^{-4}$$

Work out the following;

1. $+3 + (-3)$

2. $+10 + (-10)$

3. $3+ 14 + (-10) - (+3) -5$

4. $140+ (-140) - 25 - (-25) -3$

Solution;

1. $+3 -3 = 0$

2. $+10 - 10 = 0$

$$3. 3 + 14 - 10 - 3 - 5$$

$$= 17 - 18$$

$$= -1$$

$$4. 140 - 140 - 25 + 25 - 3$$

$$= 0 - 0 - 3$$

$$= -3$$

ASSIGNMENT

Work out the following

$$1. 6 - 4 - 5 - 6 - 2 + 6$$

$$2. 4 + (-12) + 6 + (+12)$$

$$3. -8 - (-3) + (+5) + (-8)$$

Work out the following;

$$1. -1 + 3 - 4 + (-3) + 1 - 2$$

WEEK OF THE TERM: 5

CLASS: JSS 2

SUBJECT: Mathematics

GENERAL TOPIC: Inverse/identity.

SPECIFIC TOPIC: Using additive inverse of solving simple equation.

LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to:

(i) Identify additive inverse of each number,

(ii) Calculate the given values,

(iii) Solve equation using additive inverse,

(iv) Solve more equations for easy understanding.

LEARNING RESOURCES:

Chart of inverse and identify.

REFERENCE MATERIALS

- New General Mathematics for JSS, Book 2
- New Concept Mathematics for JSS Book 2
- Essential Mathematic for JSS Book 2.

CHALKBOARD SUMMARY:

Using additive inverse to solve simple equations.

Solve the equations;

$$1. x + 6 = 10$$

Solution

$$x + 6 = 10$$

Additive inverse of +6 = -6

	$X + 6 - 6 = 10 - 6$
	$X = 4$ Ans.
	2. $y + 8 = 2 - 8$
	Solution:
	$Y + 8 = 2$
	The additive inverse of $+ 8 = - 8$
	$Y + 8 - 8 = 2 - 8$
	$Y = - 6$ Ans.
	3. $z - 6 = -4$
	Solution:
	$Z - 6 = -4$
	The additive inverse of $- 6 = + 6$
	$Z - 6 + 6 = - 4 + 6$
	$Z = + 2$ Ans.
	4. $- 7 - d = - 6$
	Solution:
	The additive inverse of $- 7 + 7$
	$= - 7 + 7 - d = - 6 + 7$
	$= - d = + 1$
	$= d - 1$ Ans.

	ASSIGNMENT
	Solve the following equations:
	1. $9 + q = - 9$
	2. $a + 6 = 8$
	3. $- 8 + n = 12$
	Solve the equation $x + 5 = - 13$

	WEEK OF THE TERM: <u>5</u>
	CLASS: <u>JSS 2</u>
	SUBJECT: <u>Mathematics</u>
	GENERAL TOPIC: <u>Inverse/identity.</u>
	SPECIFIC TOPIC: <u>Multiplicative inverse</u>
	LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to:
	(i) Identify the inverse of each number,
	(ii) Put number in a table and find the multiplication inverse,

(iii) Work out the multiplication inverse of the numbers,

(iv) Solve more questions.

LEARNING RESOURCES:

Chart of reciprocals.

REFERENCE MATERIALS

- New General Mathematics for JSS, Book 2
- New Concept Mathematics for JSS Book 2
- Essential Mathematics for JSS Book2

CHALKBOARD SUMMARY:

Multiplicative inverse of a numbers.

When any number is multiplied by 1 the result is equal to the given number.

Example

$$14 \times 1 = 14$$

$$- 3.7 \times 1 = - 3.7$$

$$n \times 1 = n$$

1 is said to be identify for multiplication.

Find the reciprocal of the following number:

Number	Reciprocal
--------	------------

5	$1/5$
---	-------

X	$1/x$
---	-------

$= 2/5$	$5/2$
---------	-------

$= p/q$	q/p
---------	-------

$= m/n$	n/m
---------	-------

Find the multiplicative inverse of the following;

Number	Multiplicative Inverse.
--------	----------------------------

4	$4/1$
---	-------

$- 0.7 = 7/10$	$-10/7$
----------------	---------

$= (\sqrt{x})/2$	$2/(\sqrt{x})$
------------------	----------------

$= 7 \frac{1}{3}$	$3/22$
-------------------	--------

$= - x/y$	$-y/x$
-----------	--------

Learners' Activities:
The learners do the above evaluation exercise.
CONCLUSION (INDIVIDUAL AND GROUP)
Teacher's Activities:
The teacher ask questions pertaining to the topic taught.
Learners' Activities:
The learners explains/answer learners' questions.
ASSIGNMENT
1. Find the multiplicative inverse of the following:
1. $1/a$
2. $2/y$
3. $3t/g$
1. -0.25 2. R

WEEK OF THE TERM: <u>5</u>
CLASS: <u>JSS 2</u>
SUBJECT: <u>Mathematics</u>
GENERAL TOPIC: <u>Inverse/identity.</u>
SPECIFIC TOPIC: <u>Using multiplicative inverse for solving simple equation</u> .
LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to:
(i) Explain the reciprocals of a number,
(ii) Show the result of the reciprocals,
(iii) Solve equations using reciprocals,
(iv) more questions.
LEARNING RESOURCES:
Chart of reciprocals.
REFERENCE MATERIALS
- New General Mathematics for JSS, Book 2
- New Concept Mathematics for JSS Book 2
- Essential Mathematics for JSS, Book 3
CHALKBOARD SUMMARY:
Solving equations using multiplicative inverse:
Using multiplicative inverse for solving simple equations;
1. $5x = 30$
Multiplicative inverse of 5 = $5/1$
$5 \times 1/5 \times \times = 30 \times 1/5$

WEEK OF THE TERM: 5

CLASS: JSS 2

SUBJECT: Mathematics

GENERAL TOPIC: Inverse/Identity.

SPECIFIC TOPIC: Word Problem (inverse operation)

LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to:

(i) estimate the values of the operations,

(ii) state the unknown values,

(ii) use it to form equation,

(iv) solve the following questions.

LEARNING RESOURCES:

Chart showing inverse identity.

REFERENCE MATERIALS

- New General Mathematics for JSS, Book 2

- New Concept Mathematics for JSS Book 2

CHALKBOARD SUMMARY:

Factorisation

This simplify means to insert brackets. It is the reverse/ opposite of expansion (removing brackets).

In other words, while expansion is the removal of brackets, factorisation is the introduction / insertion of brackets.

To factorise, simply find the HCF of the algebraic terms involved and divide each term by the HCF. Then express the expressive as the product of the HCF and the result of the division. Thus, the HCF is outside the bracket which the result of dividing each term by the HCF is inside in the bracket.

Examples

Factorise the following

(1) $12y + 8z$

(2) $4n^2 - 2n$

(3) $24xy - 16x^2$

Solutions

(1) $12y + 8z$

$= 2 \quad 12y + 8z$ or Since HCF of $12y$ and $8z$ is 4, then

$2 \quad 6y + 4z$ $4 \left(\frac{12y}{4} + \frac{8z}{4} \right)$

$3y + 2z$ $= 4 (3y + 2z)$

HCF = $2 \times 2 = 4$

Thus $12y + 8z = 4 (3y + 2z)$

(2) $4n^2 - 2n$

(3) $24xy - 16x^2$

$= \text{HCF} = 2n$

HCF = $8x$

So,

Thus $2n \left(\frac{4n^2}{2n} - \frac{2n}{2n} \right)$

$8x \left(\frac{24xy}{8x} - \frac{16x^2}{8x} \right)$

$= 2n (2n - 1)$

$= 8x (3y - 2x)$

NB: If you want to prove your results, expand your final answer and you will get the initials expressions.

Learners' Activities:

The learners carry out the above evaluation exercise.

CONCLUSION (INDIVIDUAL AND GROUP)**Teacher's Activities:**

The teacher takes some time to answer the learners' questions on the topic taught.

Learners' Activities:

The learners ask questions relevant to the lesson under discussion.

ASSIGNMENT

(1) The HCF of each of the following:

(a) $14xy^2 - 7x^2y$ (b) $54x^2 + 9xy$

(2) Factorize each of the following algebraic expression:

(a) $12c + 6d$ (b) $4a - 8b$ (c) $3ab - 6ac$

(3) copy and complete the following:

(a) $9x + 3y = 3 (\quad)$ (b) $8am - 8bm = 8m (\quad)$

(c) $3abx + 5adx = ax (\quad)$

(1) Expand find the HCF of $10xyz + 2xy$.

(2) Factorise $10xyz + 2xy$.

WEEK OF THE TERM: 6

CLASS: JSS 2

SUBJECT: Mathematics

GENERAL TOPIC: Simple equations.

SPECIFIC TOPIC: Balance method

LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to:

(i) Explain balance method,

(ii) Apply collection of like terms,

(iii) Solve balance method,

(iv) Solve more question.

LEARNING RESOURCES:

Laboratory scale.

REFERENCE MATERIALS

- New General Mathematics for JSS, Book 2
- New Concept Mathematics for JSS Book 2
- Essential Mathematics for JSS, Book 2

CHALKBOARD SUMMARY:**Balance Method**

In balance method; one can use either inverse or collection of like term.

Solve the following question using balancing method.

$$1. x + 8 = 19$$

Subtract 8 from both sides

$$X + 8 - 8 = 19 - 8$$

$$X = 11$$

$$2. x + 20 = 35$$

Subtract 20 from both sides

$$X + 20 - 20 = 35 - 20$$

$$X = 15$$

$$3. -30b = 15$$

Divide both sides by -30

$$= -30/30 \times b = -15/30$$

$$= b = -1/2 \text{ Ans.}$$

$$4. 6x = -180$$

Divide both sides by 6

$$= 6x/6 = -180/6$$

$$X = 30 \text{ Ans.}$$

$$5. -5x/3 = -6$$

Multiply both side by 3

$$= -(5x)/3 \times 3 = -6 \times 3$$

$$= -5x = -18$$

Divide both sides by 5x

$$X = 3 = 3/5 \text{ Ans.}$$

ASSIGNMENT

Simplify each of the following as far as possible.

$$(1) = 7t/15 = -300$$

$$(2) -25x = 90$$

$$(3) 2x = -10$$

$$(4) y - 4 = 9$$

WEEK OF THE TERM: 6

CLASS: JSS 2

SUBJECT: Mathematics

GENERAL TOPIC: Simple equations.

SPECIFIC TOPIC: Equation with unknown terms

LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to:

(i) Identify equations with unknown terms on both sides,

(ii) Collect the like terms,

(iii) Divide both sides with the coefficients,

(iv) Solve the simple equations

LEARNING RESOURCES:

Laboratory scale.

REFERENCE MATERIALS

- New General Mathematics for JSS, Book 2

- New Concept Mathematics for JSS Book 2

- Essential Mathematics for JSS Book 2

CHALKBOARD SUMMARY:

Equation with unknown terms and both sides.

To solve equations with unknown terms on both sides, takes the unknown terms to one side and the number to the other side, simplify and solve accordingly and solve the equations

1. $8x - 14 = x - 7$

Collect like terms.

$$8x - x = -7 + 14$$

$$7x = +7$$

Divide both sides by 7

$$= = 7x/7 = = (+7)/7$$

$$X = -1$$

2. $x - 10 + 3x = -2x + 20$

Collect the like terms.

$$X + 3x + 2x = 20 + 10$$

$$6x = 30$$

	Divide both sides by 6
	$= 6x/6 = 30/6$
	$X = 5$

	Learners' Activities:
	The learners will do the above exercise.

CONCLUSION (INDIVIDUAL AND GROUP)

	Teacher's Activities:
	The learners ask question on the lesson taught

	Learners' Activities:
	The learners ask the learners to copy the correction of the above evaluation exercise.

ASSIGNMENT

	1. $5h - 12 = 20 - 3h$
	2. $10a - 20 = 9qa + 1$
	3. $5y - 10 - 3y = 2y + 20 - y$
	(1) $-7x + 13 = -8 - 4x$
	(2) $4a - 3 = 2a + 23$

WEEK OF THE TERM: 6

CLASS: JSS 2

SUBJECT: Mathematics

GENERAL TOPIC: Simplify equations

SPECIFIC TOPIC: Equation containing brackets.

LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to:

- (i) Identify the equation containing brackets,
- (ii) Estimate the method of equation with bracket,
- (iii) Differentiate the equation with bracket to other methods,
- (iv) Apply equation with bracket method in solving equations

LEARNING RESOURCES:

Chart showing equation with brackets.

REFERENCE MATERIALS

- New General Mathematics for JSS, Book 2
- New Concept Mathematics for JSS Book 2
- Essential Mathematics for JSS Book 2

CHALKBOARD SUMMARY:

Equation with bracket method:

Solve the following equations with brackets;

To solve equations with bracket, carry out the following steps;

- Eliminate with bracket first,
- Collect the letter together on one side and the number in the other side,
- Solve the equation as usual,
- Check out solutions.

1. $2(5x - 1) = 22$

Open the bracket

$$10x - 2 = 22$$

Collect like terms

$$10x = 22 + 2$$

$$10x = 24$$

$$10x/10 = 24/10$$

$$X = 22/5 \text{ Ans.}$$

2. $5(k - 3) + 2(k - 4) = 19$

Open the bracket

$$5k - 15 + 2k - 8 = 19$$

Collect like terms

$$5k + 2k = 19 + 15 + 8$$

$$7k + 42$$

Divide both sides by 7

$$7x/7 = 42/7$$

$$K = 6 \text{ Ans.}$$

3. $3(2y - 1) = 39 - 2(y + 1)$

Open the brackets

$$6y - 3 = 39 - 2y - 2$$

Collect like terms
$6y + 2y = 39 + 3 - 2$
$8y = 40$
Divide both sides by 8
$Y = 5$

ASSIGNMENT

Simplify the following:

1. $4(2a + 7) = 3(a - 5) + 2$

2. $5(3a - 3) - 2(2a - 5) = 2a + 4$

WEEK OF THE TERM: 6

CLASS: JSS 2 Red

SUBJECT: Mathematics

GENERAL TOPIC: Simple equation

SPECIFIC TOPIC: Linear Equation containing fractions

LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to:

- (i) Identify the fractions and unknown,
- (ii) Estimate the values of the unknown
- (iii) Differentiate linear equations with other methods,
- (iv) Apply the method in solving equations.

LEARNING RESOURCES:

Chart of linear equations.

REFERENCE MATERIALS

Essential mathematics for JSS, Book 2.

New general mathematics for JSS, Book 2

New concepts mathematics for JSS, Book 2

CHALKBOARD SUMMARY:

Linear Equations Containing Fractions:

Solve the following equations;

1) $7 = 9x/(x - 1)$

Solution;

$7 = 9x/((x - 1))$

Cross multiply

$$7(x - 1) = 9x$$

Open the bracket

$$7x - 7 = 9x$$

$$-2x = 7$$

Divide both side by -2

$$(-2x)/(-2) = 7/(-2)$$

Therefore $x = 3 \frac{1}{2}$

$$2) \quad 2p + 6 = \frac{1}{3}p + 3$$

Collect like terms

$$2p - \frac{p}{3} = 3 - 6$$

The lcm of 1 and 3 = 3

$$(6p - p)/3 = -3$$

Cross multiply

$$5p = -9$$

Divide both sides by 5

$$5p/5 = (-9)/5$$

$$P = -1 \frac{4}{5} \text{ ans.}$$

ASSIGNMENT

Solve the linear equations

$$1. \quad \frac{2}{3} - \frac{1}{y} = \frac{5}{y}$$

$$2. \quad \frac{(x + 5)}{3} = \frac{(x + 4)}{2}$$

Solve the equations below;

$$4x - 5 = \frac{x}{3} + 6$$

WEEK OF THE TERM: 6

CLASS: JSS 2 Red

SUBJECT: Mathematics

GENERAL TOPIC: Simple equation

SPECIFIC TOPIC: Equations with more than one fractions.

LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to:

(i) Identify equations with more than one fractions,

(ii) choose the LCM of the denominators,

(iii) calculate the given values,

(iv) solve more questions.

LEARNING RESOURCES:

Chart and use of projectors.

REFERENCE MATERIALS

Essential mathematics for JSS, Book 2.

New general mathematics for JSS, Book 2

New concepts mathematics for JSS, Book 2

CHALKBOARD SUMMARY:

Equations with more than one fraction:

Solve the following equations ;

$$(1) \frac{x}{2} + \frac{x}{3} = 5$$

Solution;

The LCM of 2 and 3 = 6

$$\frac{(3x + 2x)}{6} = 5$$

Cross multiply

$$5x = 30$$

$$5x/5 = 30/5$$

$$= 6 \text{ Ans}$$

$$(2) \frac{(x + 5)}{3} + \frac{(x + 4)}{2}$$

Cross multiply

$$2(x + 5) = (x + 4)$$

Open the brackets

$$2x + 10 = x + 4$$

Collect like terms

$$2x - x = 4 - 10$$

$$-x = 2$$

Therefore $x = -2$

$$(3) (m - 4)/5 = 2 - m/2$$

$$(4) 2(3x - 2)/5 - (4(x - 2))/3 = 0$$

ASSIGNMENT

Solve the linear equations

$$3. \quad 2/3 - 1/y = 5/y$$

$$4. \quad (x + 5)/3 = (x + 4)/2$$

Solve the equations below;

$$(x + 5)/3 = (x + 4)/2$$

WEEK OF THE TERM: 7

CLASS: JSS 2

SUBJECT: Mathematics

GENERAL TOPIC: Introduction of Cartesian Plane

SPECIFIC TOPIC: Points on a Line.

PERIOD: 1

LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to:

(i) Define number lines,

(ii) Draw a horizontal number line,

(iii) Draw a vertical number line,

(iv) join the two lines together.

LEARNING RESOURCES:

Chart and projector.

REFERENCE MATERIALS

- Essential Mathematics for JSS, Book 2

- New Concept Mathematics for JSS Book 2

CHALKBOARD SUMMARY:

Points on a line:

Definition: A graph is a picture of numerical data.

A graph is a collection of points called vertices and line segments connecting those points, called edges that belong to a vertex are called the degree of vertex.

The number line is a graph of the positive and negative numbers.

Exercise 1; The teacher will draw number line and fix the point and ask student to give the value of those points.

Exercise 2; In the figure below give the position of p and q. Give the position of r, s, t, u and v in the same way.

ASSIGNMENT

In the figure below, describe the position of point A, Describe the position of b, c, d, e, f and the same way.

WEEK OF THE TERM: 7

CLASS: JSS 2

SUBJECT: Mathematics

GENERAL TOPIC: Introduction to cartesian plane.

SPECIFIC TOPIC: Cartesian plane.

PERIOD: 2

LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to:

- (i) Define cartesian plane
- (ii) Draw the graph of the two points,
- (iii) Fix two points and write out the value
- (iv) Solve more questions.

LEARNING RESOURCES:

Graph book, graph board.

REFERENCE MATERIALS

- Essential Mathematics for JSS, Book 2
- New General Mathematics for JSS Book 2
- New concept mathematics for JSS Book 2.

CHALKBOARD SUMMARY:

Cartesian plane

A cartesian plane is a graph with one x- axis and one y – axis. These two axes are perpendicular to each other. The origin (o) is in the exact center of the graph.

Number to the right of zero on the y axis are positive; number to the left of zero are negatives.

EVALUATION: (INDIVIDUAL AND GROUP)

Teachers' Activities:

- (1) Fill in the number both at the right – and left-hand side.
- (2) Complete the cartesian plane.

Learners' Activities:

The learners carry out the above evaluation exercise

CONCLUSION (INDIVIDUAL AND GROUP)

Teacher's Activities:

The teacher emphasis that the completion of x – axis and y - axis with numbers on it is called cartesian plane.

Learners' Activities:

The learners may ask question based on the topic of the day.

ASSIGNMENT

Use a plain graph to draw a cartesian plane

WEEK OF THE TERM: 7

CLASS: JSS 2

SUBJECT: Mathematics

GENERAL TOPIC: Introduction to Cartesian plane

SPECIFIC TOPIC: Cartesian plane.

PERIOD: 3

LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to:

- (i) Identify the coordinates,
- (ii) Give the coordinate of the vertices,
- (iii) Form an object with the coordinate
- (iv) solve more questions.

LEARNING RESOURCES:

Graph book, graph board etc.

REFERENCE MATERIALS

- Essential Mathematics for JSS, Book 2
- New Concept Mathematics for JSS Book 2
- New General Mathematics for JSS Book 2

CHALKBOARD SUMMARY:

Coordinates

A set of value that shows exact position. On the graphs, it is usually a pair of numbers; The first number shows the distance along the y- axis.

Example point A (3, 5)

Exercise 12 page 95 from new general mathematics no 1, 2 and 3.

2. Drawing an object on the graph

One can use graph to draw a shape

Exercise 12c No 4, 5 and 6

EVALUATION: (INDIVIDUAL AND GROUP)

Teachers' Activities:

What is the coordinate of the point A, B, C, D, E, F, G, H, I, J in the figure below;

Page 95 from new general mathematics book 2.

ASSIGNMENT

1. Draw an object on a graph paper

2. What is the coordinate of the point A, B, C, D, E, F, G, H, I, J in the figure below;

Page 95 from new general mathematics book 2.

WEEK OF THE TERM: 7

CLASS: JSS 2 Red

SUBJECT: Mathematics

GENERAL TOPIC: Introduction to cartesian plane

SPECIFIC TOPIC: plotting point

PERIOD: 4

LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to:

(i) prepare a cartesian plane

(ii) Place the coordinates,

(iii) Draw the object,

(iv) Plot the graph.

LEARNING RESOURCES:

Graph board and graph sheet.

REFERENCE MATERIALS

- New General Mathematics for JSS, Book 2
- New Concept Mathematics for JSS Book 2
- New essential mathematics for JSS Book 2

CHALKBOARD SUMMARY:

Plotting points

To plot a point means to draw in position on a cartesian plane.

The easiest way to plot a point is to;

1. Start at the origin

2. move along the x – axis by an amount and in a direction given by the x – coordinate of the point.

3. Move up or down parallel to the y – axis by an amount and in a direction given by the y – coordinate

Exercise 12d No 1, 2 and 3

The vertices of quadrilateral PQRS have the coordinate P (-3, 18), Q (15, 14), R (11, - 4), and S(- 7 , 0) A and B are the points: A (-3, - 7) and B (3, 0)

a. using a scale of 2cm represents 10units on both axes, plot points P, Q, R, S, A and B.

b. joins the vertices of quadrilateral PQRS cross.

c. finds the coordinates of the point where the diagonals of PQRS cross.

d. what do you notice about the points A, B and Q?

ASSIGNMENT

1. Draw an object on a graph paper.

Page 96 from new general mathematics book 2, exercise 12c.

2. What are the coordinates of the points A, B, C, D, E, F, G, H, I, J in the figure below;

Page 95 from New General mathematics book 2.

WEEK OF THE TERM: 8

CLASS: JSS 2

SUBJECT: Mathematics

GENERAL TOPIC: Completing tables of value.

SPECIFIC TOPIC: Table of values.

PERIOD: 1

LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to:

(i) Define straight line graph,

(ii) draw table of values,

(iii) complete the tables,

(iv) solve the linear graph.

LEARNING RESOURCES:

Graph board and graph sheet.

REFERENCE MATERIALS

- New essential Mathematics for JSS, Book 2
- New General Mathematics for JSS, Book 2
- New Concept Mathematics for JSS Book 2

CHALKBOARD SUMMARY:

1. Copy and complete the table below:

$$Y = x + 2$$

X	-3	-2	-1	0	1	2	3
Y	-1						

Solution;

X	-3	-2	-1	0	1	2	3
X	-3	-2	-1	0	1	2	3
+2	+2	+2	+2	+2	+2	+2	+2
Y	-1	0	+1	+2	+3	+4	+5

EVALUATION: (INDIVIDUAL AND GROUP)**Teachers' Activities:**

Copy and complete the table below.

$$Y = 2x - 1$$

Learners' Activities:

The learners do the evaluation exercise given above.

CONCLUSION (INDIVIDUAL AND GROUP)**Teacher's Activities:**

The teacher summarizes the lesson and does corrections.

Learners' Activities:

The learners ask questions about the lesson taught.

ASSIGNMENT

Copy and complete the table below.

$$Y = 3x + 1$$

X	-4	-3	-2	-1	0	1	2
Y							

2. Copy and complete the table below.

$$Y = 2x - 1$$

WEEK OF THE TERM: 8

CLASS: JSS 2 Red

SUBJECT: Mathematics

GENERAL TOPIC: Completing the table

SPECIFIC TOPIC: Straight line graph.

PERIOD: 2

LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to perform the calculating based on:

- (i) Define straight line graph,
- (ii) Prepare the table of values,
- (iii) Draw the graph.
- (iv) Join the line together and answer the question.

LEARNING RESOURCES:

Graph book and graph board.

REFERENCE MATERIALS

- New essential Mathematics for JSS Book 2.
- New General Mathematics for JSS, Book 2
- New Concept Mathematics for JSS Book 2

CHALKBOARD SUMMARY:

- 1. (a) Draw the graph of the equation $y = 3x + 6$ for the value of x from -3 to 3.
- (b) Use the graph to solve the equation $3x + 6 = 0$

Solution;

$$Y = 3x + 6$$

x	-3	-2	-1	0	1	2	3
Y							

X	-3	-2	-1	0	1	2	3
3x	-9	-6	-3	0	3	6	9
+6	+6	+6	+6	+6	+6	+6	+6
y	-3	0	+3	+6	+9	+12	+15

Draw the graph of $3x + 6 = 0$ below;

2. (a) Make the table of value for

$X = -2, -1, 0, 1, 2, 3, 4$ for the linear equation $y = 4x - 6$.

(b) Draw the graph of the linear function.

(c) Use the graph to solve the equation $4x - 6 = 0$.

Solution;

x	-4	-3	-2	-1	0	1	2
Y							

X	-4	-3	-2	-1	0	1	2
4x	-16	-12	-8	-4	0	4	8
-6	-6	-6	-6	-6	-6	-6	-6
y	-22	-18	-14	-10	-6	-2	2

(b) Draw the graph of $y = 4x - 6 = 0$

ASSIGNMENT

(a) Draw the graph of $y = 3x - 4$ for value of x from -2 to 2 .

(b) Write down the coordinates of the point where the graph cuts the y - axis.

WEEK OF THE TERM: 8

CLASS: JSS 2 Red

SUBJECT: Mathematics

GENERAL TOPIC: Complete the table

SPECIFIC TOPIC Linear graph from real life situations

PERIOD: 3

LEARNING OBJECTIVES: By the end of the lesson, the learners was able to

(i) Describe the conversion graph,

(ii) Chose a scale,

(iii) Draw and complete the table of value,

(iv) Join and plot the graph.

LEARNING RESOURCES:

Graph board and graph book.

REFERENCE MATERIALS

- New Concept Mathematics for JSS Book 2

- Essential Mathematics for JSS, Book 2

- New General Mathematics for JSS, Book 2

CHALKBOARD SUMMARY:

Weight (kg)	1	2	3	4	5	6
Cost (#)	50	100	150	200	250	300

In the above table 1kg of beans cost #50, 20kg cost #100, 3kg cost #150 and so on.

Notice that each time the weight goes up the price increase by #50. This means there is a relationship between the weight and the cost.

Scale: Sometimes we are given the scale to use on both side axes. In this case let the scale given be 1kg on the horizontal axis and 1cm to #50 on the vertical axis.

Cost and weight of beans.

Plot the graph below

ASSIGNMENT

Calculate the value of x and the size of each angle in the following:

The following table shows the distance travelled by a motorist per hour

Time(hours)	1	2	3	4	5	6
Dist.(km)	100	200	300			

(a) Use a scale of 1km to 1 hour on the horizontal axis and a scale of 1cm to 100km on the vertical axis, draw the graph of time against distance.

(b) Use the graph to find

(i) The distance travelled in 4.5 hour

(ii) How long it takes to travel a distance of 350km,

WEEK OF THE TERM: 8

CLASS: JSS 2 Red

SUBJECT: Mathematics

GENERAL TOPIC: Complete the table

SPECIFIC TOPIC: Conversion graph

PERIOD: 4

LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to:

(i) Describe the graph in a real-life situation,

(ii) Choose a scale,

(iii) Draw and complete the table of value,

(iv) Join and complete the graph.

LEARNING RESOURCES:

Graph board, graph book.

REFERENCE MATERIALS

- New essential Mathematics for JSS, Book 2
- New General Mathematics for JSS, Book 2
- New Concept Mathematics for JSS Book 2

CHALKBOARD SUMMARY:

Conversion graph;

To convert from one quantity to another you usually use a conversion table or graph.

Unlike tables that give only a selection of value, a conversion graph has the advantage that any value can be converted quickly. The conversion graph is usually straight line.

Question:

Draw a graph to convert pounds (£) into American dollar (\$) if £1 = 1.5

(a) Use the graph to convert \$84 to pounds.

(b) Use the graph to convert £36 to dollars.

Solution

Draw the pound axis horizontally and label it from 0 to 60.

Draw the dollar axis vertically and label it from 0 to 100.

Currency graph usually starts at (0, 0), so plot the point (0, 0).

The graph of conversion of pounds to dollars is shown below:

We know that 1£ = \$1.5, but this point is too close to the origin, so we choose another point.

i.e £10 = \$1.5 x 10 = \$15. So, we plot (10, 15)

Choose the 3rd point to act as check.

e.g £50 = \$1.5 x 50 = \$75. So we plot (50, 75)

The three coordinates to plot are:

(0, 0), (10, 15) and (50, 75).

Join this point together to obtain a straight-line graph starting from the origin (0, 0) as shown in the diagram above.

(a) £56 (see the dotted line)

(b) \$54 (see the dotted line)

ASSIGNMENT

(a) Draw the conversion graph between foot and centimeters.

(b) Use the graph to convert 8.5 inches to centimeters.

(c) Use the graph to convert 270 centimeters into foot.

WEEK OF THE TERM: 9

CLASS: JSS 2 Red

SUBJECT: Mathematics

GENERAL TOPIC: Inequalities in one variable

SPECIFIC TOPIC: Signs of inequalities.

PERIOD: 1

LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to perform the calculating based on:

(i) Define inequalities,

(ii) Give any three (3) symbols of inequality,

(iii) Use sign of inequality.

LEARNING RESOURCES:

Books, biro, marker, etc. For demonstration

REFERENCE MATERIALS

- Essential Mathematics for JSS, Book 2.
- New General Mathematics for JSS, Book 2
- New Concept Mathematics for JSS Book 2

CHALKBOARD SUMMARY:**Linear inequalities**

Inequality means “not equal to”

When two quantities are equal, we use symbols “=” between them e.g. $4 + 15 = 19$

i.e. $19 = 19$

But when the quantity in the left-hand side is not equal to ($\neq$) the quantity on the RHS

The symbols “<” or “>” are used.

The following are inequality symbols.

> Means greater than,

< Means less than,

$\geq$ Means greater than or equals to,

$\leq$ Means less than or equal to,

= Means equals to,

$\neq$ Means not equals to.

Examples.

(1) Describe each of the following statements in words.

(a) $11 < 21$ (b) $8 > 3$ (c) $x \leq 7$ (d) $1 + 3 \geq -15$

	(2) Reverse the above statements in (1)
	(3) Rewrite each of the following statements using $<$, $>$, $\leq$ or $\geq$
	(a) 12 is greater than 1 (b) 4 is less than 9 (c) -5 is greater than -10 (d) x is greater than or equals to 3 (e) x +5 is less than or equal to 15.
	(4) Rewrite each of the following using $=$, $<$ or $>$ in each box. Between each pers of numbers.
	(a) -13
	Solutions
	(1a. 11 is less than 21
	(b. $8 > 3$ means 8 is greater than 3
	(c. $x \leq 7$ means x is less than or equal to 7
	(d. $y + x \geq -5$ means y + 3 is greater or equals to -5
	(2a. $21 > 11$
	(b. $3 < 8$
	(c. $7 \geq x$
	(d. $-15 \leq y + 13$

ASSIGNMENT

The teacher refers to the learner to their textbook for assignment in the lesson as follows:

Essential mathematics for JSS 2, chapter 23. Exercise 23. 1

WEEK OF THE TERM: 9

CLASS: JSS 2 Red

SUBJECT: Mathematics

GENERAL TOPIC: Inequalities in one variable.

SPECIFIC TOPIC: Representing inequalities on an number line

PERIOD: 2

LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to perform the calculating based on:

- (i) Sketch a number line,
- (ii) Representing inequalities in a number line,
- (iii) State the meaning of inequality represented on a number line.

LEARNING RESOURCES:

Chart of number line with various connotations of inequality $<$, $>$, $\leq$, $\geq$.

REFERENCE MATERIALS

- Essential Mathematics for JSS, Book 2.
- New Concept Mathematics for JSS Book 2

CHALKBOARD SUMMARY:

Inequality Graph

An inequality graph is a number line indicating the range of values of a given inequality.

A number line is usually drawn horizontally with both negative and positive numbers marked on it.

For example, $x < 4$ can be represented on a number line as follows:

$x < 4$ means $x \geq 4$ means x is equal to 4 or any value greater than 4.

Examples:

(1) Illustrate the following inequalities on a number line.

(a) $x > 3$ (b) $x < -2$ (c) $x \leq 15$ (d) $x \geq -6$

(2) What does each of the following graphs represents?

(a) Show question a on a number line.

(b) Draw question b on a number line.

ASSIGNMENT

(1) Sketch the following inequalities in an number line.

(a) $x \geq 5.5$ (b) $x < 3$ (c) $16 \geq x$

(2) Write the following graph in inequalities notation

(3) Sketch the inequalities on a number line (a) $x > 5$ (b) $x \leq 6$

(4) What do the following number lines represent?

WEEK OF THE TERM: 9

CLASS: JSS 2 Red

SUBJECT: Mathematics

GENERAL TOPIC: Inequalities in one variable

SPECIFIC TOPIC: Inequalities solving

PERIOD: 4

LEARNING OBJECTIVES: By the end of the lesson, the learners should be able to perform the calculating based on:

(i) State special rule governing the solution of inequalities,

(ii) Solve the inequalities in one variable,

(iii) Represent the solution of inequalities on number line.

LEARNING RESOURCES:

Chart of inequality.

REFERENCE MATERIALS

- Essential Mathematics for JSS, Book 2.

CHALKBOARD SUMMARY:

Solving Inequalities

Algebraic inequalities or inequalities can be solved in the same way as ordinary equations. However, the rule of inequalities is as follow:

(1) Inequality remains true when the same quantity is added to or subtracted from both sided.

e.g $7 > 4$ and $7 + 2 > 4 + 2 > 4 + 2$

(2) Similarly, $7 - 2 > 4 - 2$

(2) Inequality remains true when both sides are multiplied or divided by the same positive number e.g

$8 > 12$ and $\frac{8}{2} < \frac{12}{2}$ i.e $4 < 6$

Always try to arrange for the unknown to be on the left-hand side of the inequality. This makes easier to sketch the graph

Solve these inequalities, sketch a graph of each solution.

1. $X - 2 < 3$

2. $X + 3 > 6$

3. $5x - 2 \geq 8$

4. $3 \leq 3x + 5$

Solution:

1. $X - 2 < 3$

$X < 3 + 2$

$X < 5$ Ans. Draw the number line.

ASSIGNMENT

(1) Illustrate each of the following on a number line.

(a) $-3 \leq x \leq 3$ (b) $0 < x < 3$ (c) $-6 \leq x \leq 0$

(2) Write the inequalities representing each of the following:

(3) Represent $-5 < x \leq 2$ on a number line.

(4) What does the number line represent