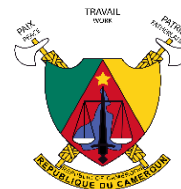




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SAMPLE LESSON: MATHEMATICS

Class: Form 3

Title of Module: Algebra and Logic

Title of Chapter: Simple Algebra

Title of Lesson: Solving Simple Linear Equations

Duration of Lesson: *55 minutes*

Name of Authors: Ngoran Magnuss Dufe,

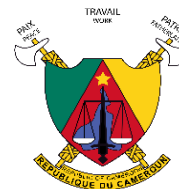


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SCHOOL: AIMS TTP COP

CLASS : Form 3

Enrolment : Male : 40

Female: 35

Total: 75

MODULE TITLE : 14- ALGEBRA AND LOGIC

TOPIC TITLE : SIMPLE ALGEBRA

LESSON TITLE : SOLVING SIMPLE LINEAR EQUATIONS,

Duration: 55mins

LESSON OBJECTIVES : *At the end of the lesson, the learners will be able to:*

- ✓ Solve simple linear equations
- ✓ Apply the resolution of simple linear equations to solve real life problems

KEY QUESTIONS:

- ✓ Can my learners come out with solutions to simple linear equations and attach meaning to these solutions?

PRE-REQUISITE KNOWLEDGE :

- ✓ Knowledge of addition, subtraction, multiplication and division of numbers.
- ✓ Knowledge of inverse operations on numbers
- ✓ Knowledge of what an equation is.
- ✓ Knowledge of forming equations from worded problems.

RATIONAL/MOTIVATION: *To tackle any real life problem using algebra we convert the given situation into a mathematical statement for it to clearly illustrate the relationship between the unknown (variable) and the information provided. One of these mathematical statement is the Linear Equation. The real life problem is modelled into a simple linear equation and solved. The application of linear equations and their solutions are observed on a wide scale to solve real life problems. Some examples are: Companies wanting to know how much they will make as profit, space scientist and astronauts working on space program, when we want to make prediction for the further and many others. As such each day and in all works of life you have a linear equation you are solving.*

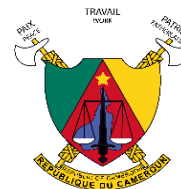


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DIDACTIC MATERIALS : *Algebra Cards*¹, metre rule

REFERENCES :

- ✓ *August 2014 Mathematics teaching syllabus Form 1 and 2. Ministry of Secondary Education, Cameroon.*
- ✓ *Karen E. Lyonga(2018) Pressbook Secondary Mathematics For Cameroon Schools Form 3. Pressbook Plc.*
- ✓ *Charles Branch-Boyd PRENTICE HALL MATHEMATICS Volume 1 Chapters 1-6*

Preparation:

- Cut cardboard papers or coloured folders into squares and rectangles of given dimension. The number should depend on the number of students and the planned technique to be used in class. Arrange them in packets as will be given to students before going to class
- Write out problem situation on a cardboard paper or type out and print if possible then photocopy depending on the number of students in class

¹ We can cut cardboard papers or coloured folders into squares and rectangles of given dimensions .

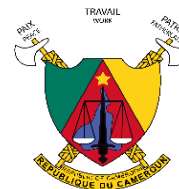


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STAGES/ DURATION	TEACHING/LEARNING ACTIVITIES	LEARNERS' ACTIVITIES	LEARNING POINTS	OBSERVATIONS
Introduction (5 mins)	<p><i>Our lesson of today is on solution of linear equations</i> <i>Prepares the chalk board and copy the exercise on the board.</i> <i>Tell them solve applications in real life of the skill to be acquired as Motivation</i> <i>Go to Verification of prerequisite knowledge.</i> <i>Call students up to give answers to each question.</i></p> <p>A/- VERIFICATION OF PREREQUISITE KNOWLEDGE 1-Evaluate the following expressions: i) $-2 + 2$; ii) $-2 - 3$; iii) $-2 + 3$; iv) $2 - 3$</p> <p>2-What can you add to the following numbers to have 0? a) $+2$, b) -2 c) $+5$</p> <p>3-Which number multiplies the following numbers to give 1? a) $\frac{1}{2}$; b) $\frac{1}{5}$</p> <p>4-Which number divides the following to give 1 a. 2 ; b. 5</p> <p>5-Which of the following expressions is an equation? b. $2 + 1 = 3$ c. $2x + 1 = 3$ d. $2 + 8$</p> <p>Wrap up the introduction by recalling the rule for each of these operations in the set of integers.</p>	<p>Come to order Write date and title of lesson in their notebooks</p> <p>Listen to instructions</p> <p>Respond to questions and follow up the work on the board and propose alternatives if any.</p>	<p>Assessment competency of learners to carry out operations (addition, subtraction, division and multiplication) on integers.</p> <p>1- i) $-2+2=0$; ii) $-2-3=-5$; iii) $-2+3=1$; iv) $2-3=-1$</p> <p>2- a) -2; b) $+2$; c) -5</p> <p>3- a) 2; b) 5</p> <p>4- a) 2; b) 5</p> <p>5- a and b</p>	<p>Listen to their responses and correct accordingly</p>
Problem Situation (5mins)	<p><i>Put up Problem Situation. If on a cardboard or distribute to learners if you typed and photocopied otherwise project if on a PPP, read out to learners or ask one of them to read.</i></p> <p>B/- PROBLEM SITUATION</p>	<p>Discuss the problem with group members and propose solutions</p>	<p>Determine the duration in weeks Amira will use to save $5000\text{frs} - 1000\text{frs} = 4000\text{frs}$</p>	<p>Give them thinking time. Listen to one or two suggestions</p>

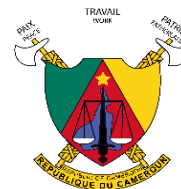


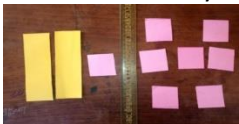
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	<p>Amira wants to save 5000frs for an end of year class party. She has 1000frs in her box and wishes to save 250frs each week.</p> <p>How many weeks, w, will it take for her to have 5000frs?</p> <p><i>Give learners 1-2 minutes to think over the problem situation and try to give answer.</i></p>	by show of hand if they can.	She saves 250frs each week.	but do not conclude. Tell them that after the lesson they will tell whether they were correct.
<p>LESSON DEVELOPMENT</p> <p>(25 mins)</p>	<p>Activity 1: Group work</p> <p><i>Ask students to get into their groups</i></p> <p><i>Distribute material for activity to groups.</i></p> <p><i>Explain by demonstrating the rules of the activity</i></p> <p>The following rules should be applied in this activity:</p> <ul style="list-style-type: none"> ➤ A PURPLE square card represents +1 and a BLUE square card represents -1 ➤ The YELLOW rectangular card represents an unknown variable. ➤ A PURPLE square card combined with a BLUE square card represents 0 (+1 + -1= 0), and should be REMOVED. <p>1) Consider the equation $2x + 1 = 7$</p> <p>A) Model the equation using cards as shown below(separate the sides with your meter rule:</p>  <p>B) How many PURPLE cards are on the left side?</p> <p>.....</p> <p>C) ADD 1 BLUE card on both sides(on a purple card)</p>	<ul style="list-style-type: none"> ✓ The students carry out the instructions, answering the questions on the activity sheet ✓ Read out their results upon request ✓ Copy summary notes in their notebooks <p>Work in groups</p> <p>Learners explain what they did in their own words</p>	<p>I- Definition of concepts</p> <ul style="list-style-type: none"> - An equation is an expression with an equal (=) sign. - A simple linear equation is an equation with the variable of power 1. Such as $x + 5 = 7$. - A solution of an equation is a value for a variable that makes an equation true. <p>II- Finding solutions to simple linear equations</p> <ul style="list-style-type: none"> - To solve a simple linear equation, we get the variable alone on one side of the equation. <p>This is done by the use of INVERSE operations that UNDO each other to obtain equivalent equations that we simplify to have the value of the variable.</p> <p>III- Worked Example</p> <p>Solve the following equations</p> <ol style="list-style-type: none"> $2x + 1 = 7$ $x - 3 = 2$ 	<p>Make sure that the students use a normal voice when discussing so that their noise does not get too loud.</p> <p>Visit all the groups make sure all students are engaged. Change position of some students if necessary.</p>

<p>EXERCISE OF APPLICATION</p>	<div data-bbox="550 306 827 425" data-label="Image"> </div> <p>D) Remove each BLUE – PURPLE card PAIR from both sides</p> <p>E) DIVIDE each side into 2 equal groups with the same number of cards</p> <div data-bbox="550 566 827 699" data-label="Image"> </div> <p>F) Put identical groups together</p> <div data-bbox="550 732 827 878" data-label="Image"> </div> <p>Ask groups to give their results and compare with other groups Give the second example</p> <p>2) Given the equation $x - 3 = 2$</p> <p>A) Model the equation using cards (separate the sides with your meter rule:</p> <div data-bbox="550 1198 827 1323" data-label="Image"> </div> <p>B) How many BLUE cards are on the left side?</p> <p>C) Why do we have blue cards instead of purple cards?</p>	<p>✓ Copy exercises in their individual exercise books.</p> <p>Listen carefully to any instructions and attempt solving in their exercise books</p>	<p>SOLUTIONS</p> <p>a. $2x + 1 = 7$ $2x + 1 - 1 = 7 - 1$ subtraction property $2x + 0 = 6$ Additive Inverse property $\frac{2x}{2} = \frac{6}{2}$ division property $x = 3$ simplify</p> <p>b. $x - 3 = 2$ $x - 3 + 3 = 2 + 3$ addition property $x + 0 = 5$ Additive Inverse property $x = 5$ Simplification</p>	<p>Listen to students and correct spoken language, and provide support if necessary.</p> <p>Verify that all group members are participating</p>
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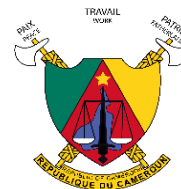


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(10mins)

.....
.....
D) ADD 3 **PURPLE** card on both sides



E) Remove each **BLUE** – **PURPLE** card **PAIR** from both sides



Correct this with the students. Ask learners to explain in their own words what they were doing in groups. Go to the problem situation and ask student to solve the problem

Exercise

- 1) Amira wants to save 5000 frs for an end of year class party. She has 1000frs in her box and wishes to save 250frs each week. How many weeks, **w**, will it take for her to have 5000frs?

- 2) Solve the equation
$$x + (-2) = -5$$

Solution to exercise

1. Given the number of weeks **w**,
The 1000 she has + 250w = 5000
So $1000 + 250w = 5000$
 $1000 - 1000 + 250w = 5000 - 1000$
 $250w = 4000$
$$\frac{250w}{250} = \frac{4000}{250}$$

$$w = 16$$

Amira will have to save 250frs for 16 weeks to have 5000frs for her end of year party.

2. Solving the equation

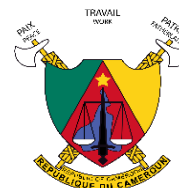


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			$ \begin{aligned} x + (-2) &= -5 \\ x - 2 &= -5 \\ x - 2 + 2 &= -5 + 2 \\ x - 0 &= -3 \\ x &= -3 \end{aligned} $	
CONCLUSION (10 Mins)	Assignment <i>Copy the assignment on the board and equally refer them to page(s) of their textbook or workbook for more exercises.</i>	Copy homework in their note books	Solution to Assignment 1) a) $3p - 5 = 10$ $ \begin{aligned} 3p - 5 + 5 &= 10 + 5 \\ 3p &= 15 \\ \frac{3p}{3} &= \frac{15}{3} \\ p &= 5 \end{aligned} $	
	1- Solve the following equations a. $3p - 5 = 10$ b. $5 - x = 12$ c. $-y + 6 = 0$ d. $\frac{x}{3} + 2 = 1$		$ \begin{aligned} 5 - x &= 12 & 5 - x + x &= 12 + x \\ 5 &= 12 + x \\ 5 - 12 &= 12 + x - 12 \\ -7 &= x \\ x &= -7 \end{aligned} $	
	2- Ndip bought 5 pens and one exercise book that costs 250frs from AIMSTA bookshop. She spends a total of 500frs. Let the cost of a pen be p a) Write down a linear equation that corresponds to this problem. b) What is the cost p of each pen?		c) $-y + 6 = 0$ $ \begin{aligned} -y + 6 - 6 &= 0 - 6 \\ -y &= -6 \\ \frac{-y}{-1} &= \frac{-6}{-1} \\ y &= 6 \end{aligned} $	
			d) $\frac{x}{3} + 2 = 1$ $ \begin{aligned} 3\left(\frac{x}{3}\right) + 3(2) &= 3(1) \\ x + 6 &= 3 \\ x + 6 - 6 &= 3 - 6 \\ x &= -3 \end{aligned} $	
			2) Given that p is the price of a pen a) 5 Times the cost of a pen + 250frs = 500frs Equation: $5p + 250 = 500$	



b) The cost of each pen is gotten by solving the equation: $5p + 250 = 500$

$$5p + 250 - 250 = 500 - 250$$
$$5p = 250$$
$$\frac{5p}{5} = \frac{250}{5}$$
$$p = 50$$

Therefore each pen costs 50frs.

LESSON ACTIVITY SHEET

LESSON PREPARED BY : NGORAN MAGNUSS DUFE, ngoranmagnussdufe@gmail.com, 674891448/690772179

The following rules should be applied in this activity:

- A **PURPLE** square card represents $+1$ and a **BLUE** square card represents -1
- The **YELLOW** rectangular card represents an unknown variable.
- A **PURPLE** square card combined with a **BLUE** square card represents 0 ($+1 + -1 = 0$), and should be REMOVED.

3) Consider the equation $2x + 1 = 7$

G) Model the equation using cards as shown below(separate the sides with your meter rule:



H) How many **PURPLE** cards are on the left side?

.....

I) ADD 1 **BLUE** card on both sides(on a purple card)



J) Remove each **BLUE** - **PURPLE** card PAIR from both sides

K) DIVIDE each side into 2 equal groups with the same number of cards



L) Put identical groups together



4) Given the equation $x - 3 = 2$

F) Model the equation using cards (separate the sides with your meter rule:





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G) How many **BLUE** cards are on the left side?

.....

H) Why do we have blue cards instead of purple cards?

.....

I) ADD **3 PURPLE** card on both sides

J) Remove each **BLUE** – **PURPLE** card **PAIR** from both sides

K) What do you observe?