

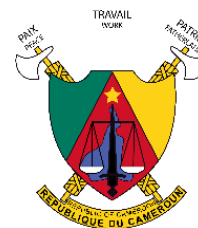


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SAMPLE LESSON: MATHEMATICS

Class: Form 1

Title of Module: Numbers, Fundamental Operations and
Relationship in the set of Numbers

Title of Chapter: Arithmetic Processes

Title of Lesson: Percentages

Duration of Lesson: 55 minutes

Name of Authors: Christy Manso

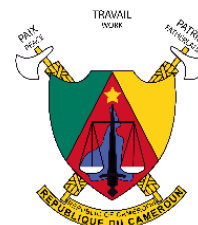


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School: AIMS TTP

Term

Class: Form One

Duration: 55mins

N° on Roll:

Number of boys:

Number of girls:

Date:

Module: Numbers, Fundamental Operations and Relationship in the set of Numbers

Topic: Arithmetic Processes

Lesson: Percentages

Objectives: At the end of this lesson, learners should be able to;

- ❖ Read and write Numbers as a Percentage of some other number;
- ❖ Convert from Fractions to Percentages and vice versa;
- ❖ Convert from Decimals to Percentages and vice versa;

Pre - requisite Knowledge: The students can;

- ❖ Identify fraction and decimal parts
- ❖ Convert from fraction to decimal and vice versa
- ❖ Multiply decimals by a multiple of 10

Rationale: Percent or percentage is an important part of our daily lives. Whether you are doing shopping or working or doing examinations or elections or sports etc., you have used percentages. Each end of year the GCE Board gives results and gives percentage passed overall, and equally percentage passed per school. Schools use these percentages to advertise their schools for more students to come in. Percentage is also used during elections and in many other real life activities. Percentage is a handy way to write fractions. Percentage can be compared more easily than fractions.

Didactic Materials: Measuring Jug, Meter stick, Card Board paper, Chalk, Ruler

References:

- August 2014 Mathematics Teaching Syllabus Form 1 and 2. Ministry of Secondary Education, Cameroon
- Andrew T. Tamambang (2017) Interaction in Mathematics Form 1(first edition), Cambridge University Press
- Professional Development Service for Teachers (PDST) – A guide

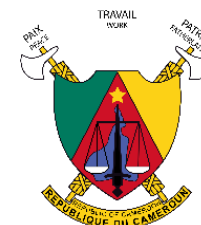


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Preparation

Prepare worksheet for activity

Type Problem situation, print and photocopy or write out problem situation clearly on card board papers (2 copies).

Draw the diagrams to be used for verification of pre-requisite knowledge or prepare a PowerPoint slide with the diagram.

Stages/durations	Teaching / Learning Activities		Learning points	Observations
	Teacher's Activities	Learner's Activities		
INTRODUCTION (10mins)	- Motivation - Verification of prerequisite knowledge: - Identify fraction and decimal parts - Convert from fraction to decimal and vice versa - Multiply decimals by a multiple of 10	<i>Demonstrate prerequisites</i>	Engage and interest students	
Problem Situation (2mins)	Present problem situation	Determine the problem that requires a solution that they may not yet know how to solve.	The problem situation should be interesting enough so that students want to solve it, and complex enough that they can solve it only with the knowledge from the lesson.	
Teaching /Learning activity (13mins)	Activity 1: What is a percent? - Define “percent” - Organize groups - Distribute worksheet for Activity 1 - Circulate among groups - Verify solution with class - If appropriate, have one group representative explain solution to rest of class - Wrap up activity by summarizing points learned.	Work in groups Learners explain what they did in their own words	Objectives of Activity 1: - Define percent - Identify the relationship between fractions, decimals, and percentages - Convert between fractions, decimals, and equivalent fractions Provide context and related information to assist understanding, such as definition or epistemology	Listen to students and correct spoken language, and provide support if necessary. Verify that all group members are participating



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Lesson Development (20mins)	Activity 2: Finding the percent. 1. Ask each group to designate a representative to stand up and count the number of girls and the number of boys in the class. 2. Explain that they will use that data to perform the activity. 3. Distribute the worksheet for Activity 2. 4. Circulate to provide support, if necessary a. Get students to give answers at each stage, get them engaged b. Be vigilant on logical presentation of solution c. Correct their spoken language as well as any misconception 5. Verify solutions with class a. If appropriate, have one group representative explain solution to rest of class 6. Wrap up activity by summarizing points learned.	-Designated student stand up and count as instructed -The other students record the information from the student doing the counting -Counting completed, the students discuss and respond to the questions on the worksheet	Objectives of Activity 2: • Determine percent • Convert between fractions, decimals, and equivalent fractions	Make sure that the students use a normal voice when discussing so that the noise does not get too loud.
Application Exercises (10mins)	<i>Copy exercises on the board. Correct exercises with students.</i> 1. Convert the following fractions into equivalent fractions and write them as percentages a. $\frac{1}{4}$ b. $\frac{11}{20}$ c. $\frac{3}{10}$ 2. Change the following percentages to fractions a. 60% b. 25%	-Copies the exercises on the board - Corrects the exercises with the students — Copies the exercises in their exercise books	Solutions 1. a. $\frac{1}{4} = \frac{1 \times 25}{4 \times 25} = \frac{25}{100} = 25\%$ b. $\frac{11 \times 5}{20 \times 5} = \frac{55}{100} = 55\%$ c. $\frac{3}{10} = \frac{3 \times 10}{10 \times 10} = \frac{30}{100} = 30\%$ 2. a. $60\% = \frac{60}{100} = \frac{6}{10} = \frac{2}{5}$	

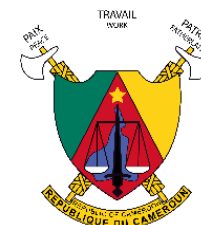


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	c. 33% 3. Change the following decimals to percentages a. 0.5 b. 0.87 c. 0.3685		b. $25\% = \frac{25}{100} = \frac{5}{20} = \frac{1}{4}$ c. $33\% = \frac{33}{100}$ 3. a. $0.5 = 0.5 \times 100 = 50\%$ b. $0.87 = 0.87 \times 100 = 87\%$	
Conclusion (5mins)	Assignment <i>Copy assignment on the board or/and refer them to some exercises in their textbook or workbook</i> 1. Calculate 25% of 80 2. 15% of 200 apples are bad. i) How many apples are bad? ii) If only 10 of the 200 apples are bad, what percent is that? iii) Convert the 15% to a) fraction, b) decimal <i>If assignment was typed out and printed, distribute copies to students.</i>	Copies the assignment in their exercise books	Solution to assignment 1. Calculate 25% of 80 Solution $25\% = 25/100$ $= 25/100 \times 80$ $= \frac{1}{4} \times 80 = 20$ Solution $15\% = 15/100$ $= 15/100 \text{ of } 200$ $= 15/100 \times 200$ $= 15 \times 2 = 30$ i) Therefore 30 apples are bad ii) $\frac{10}{200} \times 100 = 5\%$ iii) 5% as a fraction is $\frac{1}{20}$ 5% as a decimal is 0.05	

Lesson Instructions

Introduction

Motivation

Something that will motivate the students.

Verification of Prerequisite Knowledge

1. **POST** a cardboard with the diagrams shown below:



Diagram 1

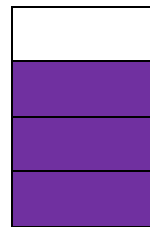


Diagram 2

2. **ASK:** Who can tell me the fraction represented by the coloured part?
 - a. If the student who responds is correct, ask her to explain how she determined the solution.
 - b. (If she is not correct, appreciate the effort and help her determine the solution by having her count the total number of parts and the coloured parts, and then creating the fraction)
 - c. **Appreciate the effort of the volunteer.**
3. **ASK:** Who can tell me the fraction represented by the part NOT colored? Call on a volunteer.
4. **ASK** all students to write in their notebooks and to convert each of the fractions in a) and b) into decimals correct to 2 dp.

Diagram 1	Diagram 2
a. $\frac{4}{6}$	a. $\frac{3}{4}$
b. $\frac{2}{6}$	b. $\frac{1}{4}$
c. $\frac{4}{6} = 0.67$; $\frac{2}{6} = 0.33$	c. $\frac{3}{4} = 0.75$; $\frac{1}{4} = 0.25$

5. **ASK** for (or **SELECT**) a volunteer to provide the solutions for Diagram 1
 - a. **WRITE** the responses on the board and verify.
 - b. If correct, ask how the response was calculated, if not, calculate.
6. **ASK** for (or **SELECT**) a volunteer to provide the solutions for Diagram 2
7. **INDICATE** one of the fractions on the board

8. **ASK:** In a fraction, what is the number above the line is called? And the number below the line?
9. **INDICATE** one of the decimals on the board
10. **ASK:** How many decimal places does this number have?
 - a. In this number, the place following the decimal point is which place?
 - b. The place after the tenths place is which place?
11. **WRITE** on the board: **0.4**
12. **ASK:** Who can convert this to a fraction?
 - a. **ASK** how she determined the conversion and clarify her response: Since the 4 is in the tenths place, put 4 over 10 to create $\frac{4}{10}$. Simplify to $\frac{2}{5}$.
13. **ASK:** Who can multiply 0.4 by 10?
 - a. **Review** answer and demonstrate that it requires moving the decimal point **one place** to the right.

Problem Situation

Students at the University of Yaoundé I were studying the rate of road accidents between Yaoundé and Bafoussam. For a specific bus agency, they recorded that in one month, the agency made 368 trips from Yaoundé to Bafoussam. On 47 of these trips, there were minor accidents (no fatalities, but sometimes injuries). The students reported that 27% of the trips resulted in an accident, and posted the results to WhatsApp. This resulted in many people being afraid to travel with that bus agency. The bus agency complained and said that the results were wrong because one of the students was the son of a competitor. Who is correct, the students or the bus agency?

Activity 1: What is a percent?

Define “percent”

1. **WRITE** “Percent” on the board.
2. **SAY:** The word “percent” comes from two words. “per” means “for each”. (write the words on the board), and “cent” comes from the Latin word “centum” meaning “hundred”. (write the words on the board)
3. Percent (or per cent) means “for each hundred”, and we simplify this by saying “out of 100”.
4. “22 percent” means “22 out of a 100” and is written as 22% (write on the board)
5. The mathematical symbol for percent is %

Organize groups

1. **SAY:** Everyone get into your groups

Distribute worksheet for Activity 1

1. As you distribute the worksheet, remind the class of the responsible group behavior that should be practiced



Instructions for students:

In a class of 100 students, 25 students obtained average marks above 16.

1. What **fraction** of the students had average marks above 16?
2. Can you express this fraction as a **sentence** using the words, “out of 100”?
3. Can you express this as a **percent**?
4. What is the **decimal** value of the fraction of students with marks above 16?
5. What do you observe about these three equivalent expressions?

Circulate among groups to listen to students and correct spoken language, and provide support if necessary.

1. Provide guidance without giving solutions
2. Ensure that all students are participating

Verify solution with class

1. Ask for volunteers to provide answers to the questions.

If appropriate, have one group representative explain solution to rest of class

1. If there is a need for clarification, as one of the groups that found the correct answer to explain.

Wrap up activity by summarizing points learned.

Activity 2: Finding the percent.

1. Ask each group to designate a representative to stand up and count the number of girls and the number of boys in the class.
2. Explain that they will use that data to perform the activity.
3. Distribute the worksheet for Activity 2.
4. Circulate to provide support, if necessary
 - a. Get students to give answers at each stage, get them engaged
 - b. Be vigilant on logical presentation of solution
 - c. Correct their spoken language as well as any misconception
5. Verify solutions with class
 - a. If appropriate, have one group representative explain solution to rest of class
6. Ask if someone can respond to the question in the problem situation.
7. Wrap up activity by summarizing points learned.

Annexes

Worksheet for Activity 1

In a class of 100 students, 25 students obtained average marks above 16. - What fraction of the students had average marks above 16? - Can you express this fraction as a sentence using the words, “out of 100”? - Can you express this as a percent? - What is the decimal value of the fraction of students with marks above 16? - What do you observe about these three equivalent expressions?	In a class of 100 students, 25 students obtained average marks above 16. - What fraction of the students had average marks above 16? - Can you express this fraction as a sentence using the words, “out of 100”? - Can you express this as a percent? - What is the decimal value of the fraction of students with marks above 16? - What do you observe about these three equivalent expressions?
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Worksheet for Activity 2

- Count the number of girls in class. - Count the number of boys in class. - Calculate the total number of students. - Write the number of girls as a fraction of the total number of students. - Convert this fraction to a decimal value - Can this value be expressed as a percent? If so, write the percent. - Do the same for the boys in the class. - What can you observe about the percent of girls and the percent of boys? - What happens when you add them together?	- Count the number of girls in class. - Count the number of boys in class. - Calculate the total number of students. - Write the number of girls as a fraction of the total number of students. - Convert this fraction to a decimal value - Can this value be expressed as a percent? If so, write the percent. - Do the same for the boys in the class. - What can you observe about the percent of girls and the percent of boys? - What happens when you add them together?
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