

Numeracy 1

Breakthrough to Numeracy

Facilitator's Guide

OSEC

Ministry of Basic Education

Copyright

Copyright © 2018 by Botswana Ministry of Basic Education.

ISBN:978-99968-453-7-6

First Published 2018

Numeracy 1: Breakthrough to Numeracy - Facilitator's Guide.

All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, or any information storage and retrieval system, without written permission from the copyright owners. Permission is granted to copy for non-commercial classroom use only.

A lot of effort has been made to obtain permission to utilise copyright material. In the event where copyrighted material has been used without permission, we commit to correct the anomaly once it has been brought to our attention.

This material has been prepared by the Botswana Ministry of Basic Education, Out of School Education and Training (OSET) Unit and Department of Curriculum Development and Evaluation: with the support of UNICEF and Joint Minds Consult (JMC).

The Out of School Education for Children (OSEC) project is a Botswana Government initiative supported by United Nations Children's Fund (UNICEF). Joint Minds Consult (JMC) – an Education, Research and Training Consultancy – provided the technical support for the development of the OSEC policy, Curriculum and Assessment Framework, modules, learner materials, the facilitator guides, recognition to prior learning diagnostic tools and the Implementation Strategy. The technical support entailed developing the content, editing, designing and publishing of the materials as well as designing the pilot test protocols.

Project coordination was provided by the Ministry of Basic Education (MoBE), Out of School Education and Training (OSET) Unit. Task Teams for each of the five learning areas (Setswana, English, Life Skills, Numeracy and Science) were from the Department of Curriculum Development and Evaluation (CDE). The Department provided technical quality control. The Reference Committee was drawn from key MoBE departments and other relevant institutions.

Copyright © 2018 by Botswana Ministry of Basic Education.



Table of contents

Note to the Facilitator	vii
Unit 1: Sorting, Matching Classifying and Counting Objects	1
Unit 2: Numbers	7
Unit 3: Number Operations	15
Unit 4: Using Botswana Money	21
Unit 5: Lines and Shapes	25
Unit 6: Measurements	35
Unit 7: Data Handling	43
End of Module Revision Test	49

Acknowledgements

The Numeracy 1: Breakthrough to Numeracy Facilitator's workbook was developed, designed and finalised by the following teams;

Technical Expertise and Leadership

Patrick D. Molutsi, Dr.	Lead Consultant	Joint Minds Consult
Lily Chipazi	Project Manager	Joint Minds Consult

Authors

Kgalamelo R. Mafa	Author	Joint Minds Consult
Colwasi G. Mthunzi	Subject Specialist	Joint Minds Consult
Patrick D. Molutsi, Dr.	Co-author	Joint Minds Consult
Lily Chipazi	Co-author	Joint Minds Consult

Editorial Services

Lily Chipazi	Editorial Services	Joint Minds Consult
Colwasi G. Mthunzi, Dr.	Editorial Services	Joint Minds Consult
Kelebogile N. Sebina	Editorial Services	Joint Minds Consult

Designer, Artists and Photographer

Jackson Ndhlovu	Designer	Joint Minds Consult
Giel Kgamane	Artist	Joint Minds Consult

Project Coordination Team

Lillian R. Sediadie	OSET
Compie Mbulawa	CDE

Task Team

Thibogang Malibala	CDE
Gabriel Bagwasi	CDE
Seabe Raditladi	CDE
Ineeleng Rabasaakane	OSET
Goleele Lillian Rahube	SOUTH EAST REGION

Reference Committee

Name	Institution	Position
Idowu Biao, Professor	UB	Chairperson
Antoinette Motiki	BE-OSET	Member
Lesego Pelotona	BOU	Member
Tiny Ntshinogang	MoBE	Member
Justice Gaeonale, Dr.	BQA	Member
Susan Makgothi	BEC	Member
Magolegwa Kwele	BEC	Member
Seoketso Marata	CDE	Member
Compiie Mbulawa	CDE	Member
Lechani Rammoni	BEC	Member
Lillian R. Sediadie	BE-OSET	Member
Melody G. Morei	DTT&TE	Member
Ontlametse Kebatenne	OSET-Gantsi Region	Member
Edwin Lorekang	OSET-Tsabong	
Goleele Lillian Rahube	BE-OSET	Member
Lentikile Matswagothata	MoBE -ETSSP	Member
Beauty Abbey	MoBE-Secondary	Member

Logistics Team

Shirley Letswamotse	OSET
Ineeleng Rabasaakane	OSET
Kudzani Bazibi	Joint Minds Consult
Joseph Mwelwa Jr.	Joint Minds Consult
Hellen K. Raseroka, Dr.	Joint Minds Consult

ABBREVIATIONS

<i>BE-OSET</i>	Basic Education – Out of School Education and Training
<i>BEC</i>	Botswana Examinations Council
<i>BQA</i>	Botswana Qualifications Authority
<i>BOU</i>	Botswana Open University
<i>CDE</i>	Curriculum Development and Evaluation
<i>DTT & TE</i>	Department of Teacher Training and Technical Education
<i>ETSSP</i>	Education and Training Sector Strategic Plan
<i>MoBE</i>	Ministry of Basic Education
<i>OSEc</i>	Out of School Education for Children
<i>OSET</i>	Out of School Education and Training

Note to the Facilitator

Introduction

The facilitator should introduce him/herself to the learners. Explain what a facilitator does, for example, a facilitator assists learners to learn by helping them to carry out activities that help them develop better understanding of the subject and in the process, acquire requisite skills.

Using this Facilitator Guide

This facilitator's Guide is meant to help with the teaching of breakthrough to numeracy level 1. The activities are designed to develop basic numeracy skills of learners: reading and writing numbers, carrying out basic number operations and carrying out simple measurements. The guide should be used as a whole in order to attain the intended outcomes.

Facilitators are encouraged to take every opportunity to use the guide. The Guide also helps the facilitator to effectively use the Breakthrough to Numeracy Learner's Workbook Level 1. It presents the module learning outcomes, opportunities for assessment, approaches to teaching and learning, learning activities and the requisite resources and references for the attainment of the learning outcomes outlined in the modules. The guide also provides answers to the practice and skills development items, that the learner is expected to undertake.

Cultural sensitivity

Cultural sensitivity is a set of skills that help you to understand and learn about people who are different from you. They may be different because of their way of life, customs, values, religion, disability, gender or race. It is about awareness of cultural differences and similarities between people.

For example, there are gender stereotypes in the way girls and boys are socialized. Boys in most families are socialized to look after farm animals and to be engineers and doctors whereas most girls are socialized to do housework and to be nurses and teachers.

The facilitator has to help change these stereotypes by encouraging girls to be engineers and doctors, too and boys to also do housework, obtain training in nursing, dressmaking and home economics, etc.

People are not the same due to cultural diversity and other factors, and cultural sensitivity recognises that your culture is no better or worse than any other. Cultural sensitivity instils in the learner an appreciation of the values of respect, cooperation, unity and tolerance.

Please make use of the activities provided in both the facilitator's guide and learner's book to demonstrate to learners that different people also share some things in common that we should celebrate such as respect for elders. This is shown in the way people from different tribes greet elders.

We should also celebrate the differences because they show the country's variety of people, knowledge and skills which make Botswana to respect each other and fight intolerance of one another due to discrimination or prejudice. As such, in areas where learners prefer outdoor activities, the facilitator could incorporate knowledge and skills in athletics, arts and sports like football, etc. You can also bring in experts and elders from the community to facilitate some sessions.

Breakthrough to Numeracy Modules

Breakthrough to Numeracy Level 1 comprises one module: **Breakthrough to Numeracy (BTN01)**. This module requires a learner who can read and write. The numeracy skills development activities are reflected in Breakthrough to Numeracy Learner's Workbook Level 1.

Learning Outcomes

The learner will be able to:

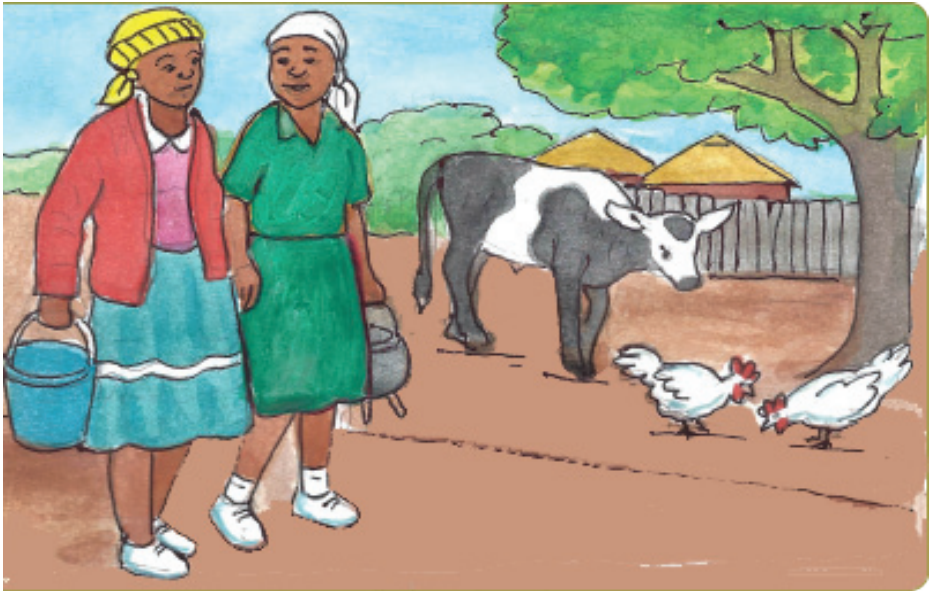
- BTN01.1.** Sort, match, classify and count objects.
- BTN01.2.** Demonstrate counting, reading and writing numbers.
- BTN01.3.** Carry out number operations.
- BTN01.4.** Demonstrate simple knowledge in using Botswana money.
- BTN01.5.** Identify 2-D and 3-D shapes and elements of shapes in order to apply this knowledge in everyday life.
- BTN01.6.** Demonstrate knowledge of measurement using simple non-standard instruments in various contexts.
- BTN01.7.** Demonstrate simple data handling skills.

Units in Breakthrough to Numeracy Learner's Workbook

The Learner's Workbook comprises the following units:

- Unit 1 : Matching, Sorting, Classification and Counting objects
- Unit 2: Numbers
- Unit 3: Number Operations and Fractions
- Unit 4: Using Botswana Money
- Unit 5: Lines and Shapes
- Unit 6: Measurement
- Unit 7: Data Handling

Sorting, Matching, Classifying and Counting Objects



Unit 1: Sorting , Matching, Classifying, and Counting Objects

Learning Outcome 1

BTN01.1 Sort, match, classify and count objects.

Evidence Requirements

A portfolio evidence containing:

- a) An observation sheet used for assessing a 10 minute practical task involving sorting, classification and matching conducted by learners in pairs.
- b) A worksheet on classification, matching and counting up to ten objects found in their surroundings.
- c) Tracings of numbers between 1 and 10 prepared by individual learners.

Performance Criteria

BTN01.1. 1 Sort and classify objects.

BTN01.1.2. Identify numbers from 1 – 10.

BTN01.1.3. Count using numbers from 1 – 10.

BTN01.1.4. Write numbers 1 to 10 in numerals and words.

BTN01.1.5. Identify simple fractions.

Range Statement

Sort and classify objects to include but not limited to the use of colour, size and type of object.

Identify numbers as words and numerals for numbers up to 10.

Write numbers up to 10 as single numbers and in groups.

Sorting and Classifying Objects

Topic Introduction

Introduce this topic by asking the learners how they sort objects at their homes. Ask them to brainstorm and as a group, prepare a summary on sorting objects at home. Discuss the importance of knowing how to sort and classify objects.

Teaching / Learning Approaches

- Brainstorming
- Discussion
- Demonstration and
- Cooperative work

Teaching Procedure

Introduce and explain the learning outcomes to the learners and explain the rationale for the expected outcomes.

1. Sorting and classifying objects

- a) Ask learners to tell you the colours that they know and write them on the board.
- b) Let your learners brainstorm and then list objects with their colours. Assist them to list as many as they possibly can.
- c) Let the learners describe, sort and classify what they can see in their environment using their own criteria such as colour, and the size of objects.

2. Counting from 1-10

- a) Demonstrate how to sing the number song in the Learner's Workbook. Ask them to sing it on their own.
- b) Ask the learners to count, and you record the numbers which they know. This should help you to know their level of counting.
- c) Demonstrate counting objects by asking learners to observe you count move and relate to the objects that you are counting.
- d) Consolidate their counting through giving them a lot of practice ranging from the concrete to the abstract. Vary the number of objects being counted.
- e) Show them how to write numbers from 1 to 10 taking a single number at a time.
- f) Give your learners as much practice as possible for them to learn the skill of writing numbers.
- g) Ask learners to do **Activities 1.1 to 1.5** in the learners' book for further practice.

3. Number Names

- a) Introduce learners to the number names by tracing number names in the learner's book.
- b) Give learners practice through playing the number card games,

c) Ask the learners to do **Activities 1.6 and 1.10** to consolidate their counting, writing numbers in words and in numerals. Introduce the number zero. Explain the importance of the number zero in the number system,

Learner Activities

Give the learners some homework on **Activities 1.11 to 1.12** in Breakthrough to Numeracy Workbook to help them consolidate knowledge and skills learnt. Remember to give the learners as much practice and re-enforcement as possible for them to master the counting skill.

Teaching/ Learning Approach

You should demonstrate how counting in groups is done. It is important for the learners to grasp the skill. Re-enforcement is very important at this early stage. Let them count real objects in pairs. Once they master the skill, they should progress to counting in threes, fours and in fives.

Teaching Procedure

1. Recap counting in ones with the whole group.
2. Ask the learners to arrange objects in pairs.
3. Demonstrate counting in pairs.
4. Ask the learners to count in 2s, 3s, 4s and 5s.
5. Consolidate skills acquired by asking the learners to carry out re-enforcement activities.

Activity 1.11

Ask the learners to do **Activity 1.11** individually. Use their grades to assess progress made.

Unit 1 Assessment

Give your learners the revision exercise for both consolidation and assessment purposes. The grades attained should be diagnostic and direct you to areas that your learners have difficulties.

=====

Unit

2

Numbers

41		43		45					50
40		38							31
21				25	26	27			30
				16	15	14	13		11
1	2		4					9	

Unit 2: Numbers

Learning Outcome 2

BBTN01.2 Demonstrate the skill of reading, counting and writing numbers.

Evidence Requirements

A portfolio evidence containing:

1. A graded chart showing numbers ranging from 1-100 classified as odd and even.
2. A graded test covering writing numbers, in numerals and in words, place value comparing numbers, using symbols and ordering numbers.

Performance Criteria

BTN01.2.1. Read and write numbers in numerals and in words.

BTN01.2.2. Count objects in 1s 2s 5s and 10s

BTN01.2.3. Classify numbers as odd and even.

BTN01.2.4. Use the symbols $>$ and $<$ to indicate the relative size of two numbers.

BTN01.2.5. Compare numbers using symbols $>$ and $<$

BTN01.2.6. Order 2-digit numbers

BTN01.2.7. Use place value of up to 100

BTN01.2.7. Identify numbers as odd and even

Range Statement

Identify numbers as words and numerals for numbers up to 100.

Count using numbers up to 50 in 1s, 2s, 5s and 10s, forward and backward and in multiples of 2, 3, 4, 5 and 10s.

Arrange numbers in descending and ascending orders up to 100.

Identify and use place value of up to hundreds.

Carry out number operations to include addition, subtraction, division and multiplication.

Numbers

Topic introduction

Introduce this topic by reminding the learners of the importance of numbers. The aim of this unit is to help the learners to build on the number sense introduced in the unit.

Teaching Learning Approaches

Use pictorial examples and let the learners practice. Note that demonstration, imitation and practice will help your learners to master the skills in counting using numbers.

Teaching Procedure

- a) Introduce the concept of 2 digit numbers by asking learners to do the Activity in the Learners' Workbook Help the learners to identify the pattern that emerges as the numbers increase.
- b) Use the number line in the learner's book to further demonstrate writing two digit numbers.
- c) Use the square chart to build up numbers up to 100. Discuss the patterns found in the 100 square chart.
- d) Use the number line to compare numbers between 1 and 100.
- d) Use the square chart to build counting in 2s, 5s and tens.
- e) Introduce writing numbers in words..
- f) Give learners practice by doing Activities 2.1-2.9.

Odd and Even Numbers

- a) Ask the students to list all the different types of numbers they know and remember . Write the numbers on the board.
- b) Ask the learners to separate the odd and even numbers. Let the learners discuss what they observe about the two sets of numbers. Ask them to say what conclusion they drew.
- c) Consolidate the learner's conclusion by explaining what odd and even numbers are.
- d) Ask the learners to do **Activities 2.2 and 2.3.**

3. Comparing Numbers using greater and smaller than

- a) Ask the learners to compare real life objects using the terms bigger than and smaller than,
- b) Introduce the symbols $<$ and $>$
- c) Use the number line to compare numbers between 1 and 100. Give your learners further practice for consolidation of the skills gained.
- d) Ask your learners to do **Activity 2.12** and **2.16**.

Activities

Activities 2.2 and 2.3

Ask the learners to do **Activities 2.2 and 2.3** in pairs. Encourage them to help each other to do the activity. Mark and correct misconceptions observed.

Comparing Numbers using $<$ and $>$

Introducing odd and even numbers

Ask the learners to compare real life objects using the terms bigger and smaller than. Use the number line to introduce smaller and greater than and explain the concepts.

Teaching /Learning Approaches

Use the inductive approach where they start by comparing and conclude by explaining after practicing using many examples. Explain to the learners the new concepts if you find that they cannot deduce meaning from the examples.

Teaching Procedure

1. Carry out a practical demonstration of smaller than and bigger than.
2. Use the number line to demonstrate the concept $<$ and $>$.
3. Consolidate the new knowledge by practice.

Activities

Activity 2.4 to 2.5 should be done to give your learners adequate grounding in these concepts. Correct re-occurring misconceptions. Encourage them to help each other to do the activities.

4. Place Value

- a) Allow your students to discuss the importance of place value.
- b) Explain the concept of tens and units using an abacus. Use the internet to enrich both your knowledge and your learners' understanding by using the internet.
- c) Ask your learners to do Activity 2.9.
- d) Provide more activities for learners to practice.

Unit Assessment

Give your learners the revision test in the Learners' Workbook. Mark the test and give them feedback. Note also the progress made by each individual learner. This test can also act as a diagnostic tool. Provide remediation for those who would have found difficulties with number operation

Unit

3

Number Operations



Unit 3: Number Operations

Learning Outcome 3:

BTN01.3 Carry out number operations

Evidence Requirements

A portfolio containing:

1. A graded test covering addition, subtraction, multiplication and division.

Performance Criteria

BTN01.3.1 Use the symbol + and = in addition

BTN01.3.2 Use the symbol – and = in subtraction of numbers.

BTN01.3.3 Subtract numbers horizontally and vertically without carrying.

BTN01.3.4 Use the symbol X in multiplication.

BTN01.3.5 Multiply up to 2 digit numbers with a product of up to 100.

BTN01.3.6 Explain the concept of division.

BTN01.3.7 Use the symbol \div for division and \div in the division of numbers.

BTN01.3.8 Divide even numbers up to 1000 by 2, 5 and 10 without leaving a remainder.

BTN01.3.9 Identify equal parts , halves, thirds and quarters.

BTN01.3.10 Read and write fractions

BTN01.3.11 Add halves, thirds and quarters of shapes and objects to show one whole.

Number Operations

Topic Introduction

Introduce the topic by discussing the importance of number operations. Emphasise that we apply number operations on a day to day basis. Let the learners brainstorm where number operations are applied on a day to day basis.

Teaching Learning Approaches

- ♦ Brainstorming
- ♦ Discussion
- ♦ Demonstration and
- ♦ Cooperative work
- ♦ Pair work

Teaching/ Learning Procedure

1. Addition of whole numbers

- a) Introduce addition by putting together items from two different sets using concrete objects.
- b) Introduce the symbol (+) and (=) based on the activity above
- c) Ask learners to do **Activity 3.1** on their workbook.
- d) Discuss with students different methods of addition e.g.
 - ♦ Using a number line
 - ♦ Representing numbers with Manipulatives

- e) Demonstrate how to add two 2-digit numbers without carrying vertically with more emphasis on correct alignment according to place value. E.g.

i)	4	ii)	11
	+ 2		+ 3
	_____		_____
	=====		=====

2. Subtraction of whole numbers

- a) Discuss with learners different situations where subtraction arises. E.g. Taking away, comparison and inverse then introduce subtraction sign (-).
- b) Demonstrate subtraction using concrete objects
- c) To consolidate ask learners to do **Activity 3.2**
- d) Demonstrate how to subtract two digit numbers without borrowing vertically with more emphasis on correct alignment according to place value

i)	4	ii)	11		19
	ñ 2		ñ 1		ñ 5
	_____		_____		_____
	=====		=====		=====

3. Multiplication of whole numbers

- a) Discuss and demonstrate ways in which multiplication can arise. Emphasise the multiplication sign (+)
- b) Ask learners to study the examples provided in the workbook and do **Activity 3.3 and 3.4**
- c) Discuss with learners the multiplication chart in the workbook
- d) Ask learners to fill in the spaces in the multiplication chart.

- e) Ask learners to do **Activities 3.5** and **3.6** and ask them to notice the pattern when multiplying by 10.
- f) Provide learners with the opportunity to practice further multiplication facts.

4. Division of whole numbers

- a) Introduce division by using examples similar to **Activity 3.7** where division arises. Emphasise division sign (\div)
- b) Demonstrate division as repeated subtraction
- c) Demonstrate division as an inverse of multiplication
- d) Consolidate by giving learners **Activities 3.8** and **3.9**

5. Fractions

- a) Demonstrate 1 whole, $\frac{1}{2}$, $\frac{1}{3}$ and $\frac{1}{4}$ with concrete and semi-concrete objects.
- b) Discuss fraction notation (numerator, division bar and denominator) and general meaning of a fraction.
- c) Provide learners with an opportunity to identify fractions demonstrated on shaded shapes.
- d) Ask learners to shade particular fractions having been provided with the shapes.
- e) Demonstrate addition of fractions to make up a whole.
- f) Ask learners to do **Activity 3.10**.

Unit

4

Using Botswana Money



Unit 4: Using Botswana Money

Learning Outcome 4

BTN01.4 Carry out number operations using Botswana money

Evidence Requirements

1. A chart showing correctly identified / labelled specimens of Botswana coins and notes.
2. A pricing chart showing a clear understanding of the monetary value for different coins and notes.
3. A 30- minute test involving addition and subtraction of money.
4. A simple budget for starting a small business covering infrastructure, products and over heads.

Performance Criteria

BTN01.4.1. Identify Botswana currency.

BTN01.4.2. Differentiate between Botswana coins and notes.

BTN01.4.3. Carry out addition of money.

BTN01.4.4. Carry out subtraction of money.

BTN01.4.5. Share money using predetermined criteria.

BTN01.4.6. Prepare a simple budget.

Range Statement

Botswana currency to include all the pula denominations

Botswana coins to include the 5 thebe, 10 thebe, 25 thebe, 50 thebe, 1 Pula and 5 Pula coins.

Botswana notes to include 10, 20, 50, 100 and 200 Pula notes.

Carrying out addition and subtraction of money to include manipulation across the denominators.

Sharing to include dividing across the denominations.

Prepare a simple budget to include business and any other budget that is of interest to the learners.



Number Operations Using Botswana Money

Collect specimens of Botswana notes and coins. Ask the learners to identify the different coins and notes. Explain to the learners the value equivalence between coins and notes. Recognise prior learning and proceed if your learner indicates mastery of requisite skills.

Teaching Learning Approaches

The approach suggested for the topic is a practical application of experiential knowledge where learners apply their prior knowledge for identifying different denominations. Learners also use their knowledge of addition, subtraction and division in the monetary context and in budgeting. Entrepreneurial creative experience should be encouraged for budgeting.

Teaching/Procedures

1. Ask the learners to Identify Botswana currency.
2. Allow them to practice number operations based on monetary values.
3. Let them apply knowledge of Botswana money to real life situation in budgeting.

Activities

Ask learners to do **Activities 4.1 to 4.4** to consolidate their knowledge.

Ask your learners to prepare a budget for starting a business. This can be done as a cooperative activity with some groups preparing budgets for different aspects of the business.

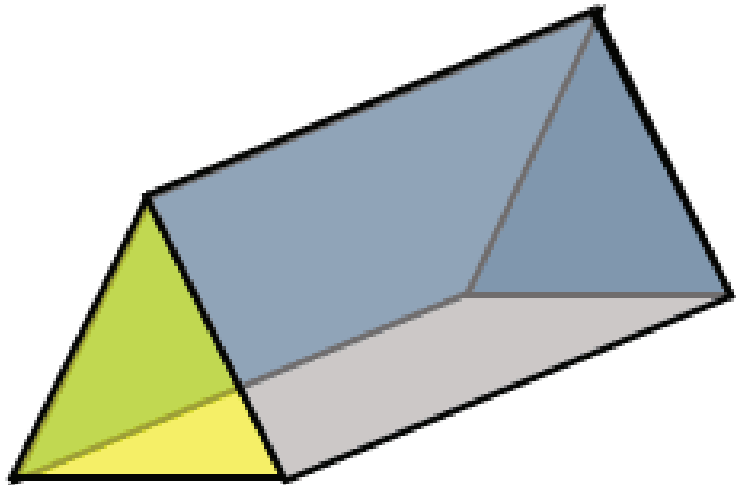
Unit Assessment

The revision exercise for this Unit can be done in written or oral form. Always cater for those who may not be able to write for whatever reasons. Grade the activity and assess the learners' weaknesses and strengths. Give them feedback and correct errors or omissions.

Unit

5

Lines and Shapes



Unit 5: Lines and Shapes

Learning Outcome 5

BTN01.5 Identify 2-D and 3-D shapes and elements of shapes in order to apply this knowledge in everyday life.

Evidence Requirements

Portfolio of evidence containing:

1. Individually drawn vertical and horizontal lines.
2. Pair work sample of cut out and coloured flat shapes including 1 square, 1 rectangle, 1 kite, 1 circle and a triangle.
3. A model of a cone, a cuboid, a cylinder, a cube and a prism done through cooperative work with each group making one type of model.

Performance Criteria

BTN01.5.1. Draw a vertical line, a horizontal line and a slanting line.

BTN01.5.2. Name flat shapes and figures.

BTN01.5.3. Identify solids.

BTN01.5.4. Make 3-dimensional shapes

Range Statement

Flat shapes should include rectangles, squares, triangles, kites and circles.

Solids should include cubes, cuboid, cones and cylinders.

Lines and Shapes

1. Vertical and Horizontal Lines

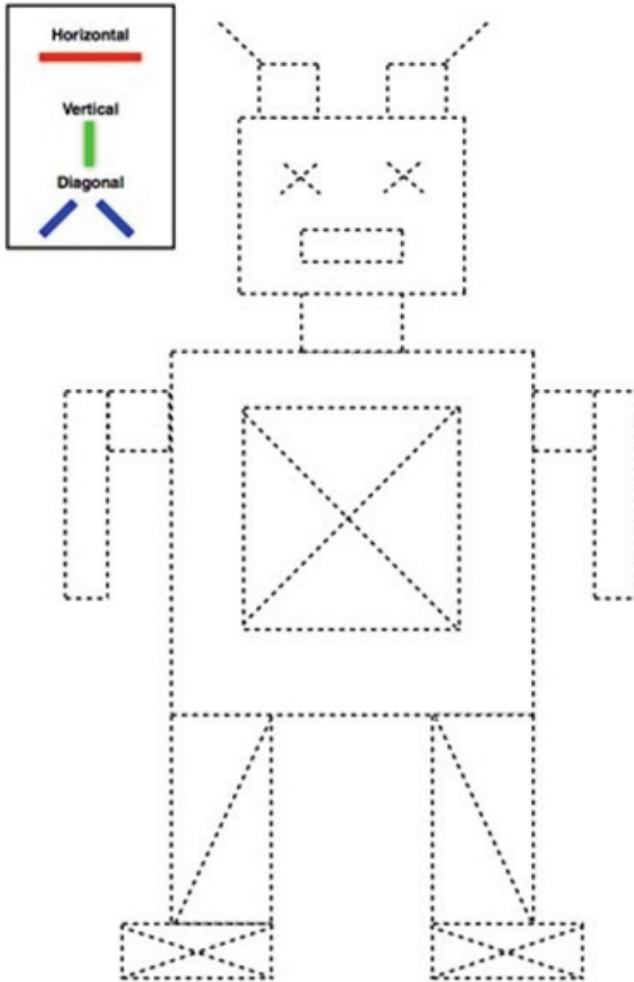
You can introduce the topic by drawing a vertical line and then ask the learners to identify vertical lines which they can see. Then draw a horizontal line and ask learners to identify horizontal lines which they can see. Ask them to say what vertical and horizontal lines are.

Teaching/Learning Approaches

Use induction where learners identify examples and make their own conclusions. Use picture analysis for consolidation of knowledge gained. Recognise prior learning as most learners will be familiar with straight lines.

Teaching/Learning Procedure

- a) Ask learners to move around and draw lines they can observe. They then come and discuss in groups the types of lines. Group them accordingly.
- b) Provide learners with different shapes of objects that are constructed with lines and ask them to trace by colouring lines of the same type with a particular colour e.g.



- c) Photocopy the diagram so that each learner has a copy.
- d) Ask learners to trace lines in the diagram to consolidate their skills in drawing lines.

Activities

Engage the learners in group work. Let them show where use vertical and horizontal lines are used.

2. Two Dimensional Shapes

Use cuttings of 2-dimensional shapes to introduce dimensional shapes. Use the learners' prior knowledge to differentiate between circles, rectangles and triangles. Let your learners identify where they are used in real life.

- a) Introduce 2-D shapes by discussing learners' prior knowledge of flat surfaces and shapes they found around them.
- b) Ask learners to identify and name rectangles, triangles, circles, kites and squares (**Activity 5.1**)
- c) To consolidate the number of corners in a shape ask learners to do Activity 5.2

Teaching/Learning Approaches

In this topic you can start from the general learner's prior knowledge of flat surfaces, and shapes. Then you can proceed to specific shapes. This would be from deduction to induction. You can also use group work to cut and make 2-dimensional shapes.

Teaching/Learning Procedure

1. Develop learners' understanding of the concepts of 2-dimensional shapes.
2. Ask your learners to identify and name rectangles, triangles, the circle, kite and squares.

3. Ask them to relate the shapes to the number of corners they have.
4. Let them practice drawing different shapes.

Activities

Engage the learners in group work where they show where circles, triangles, squares and rectangles are used.

Ask the learners to do **Activities 5.1 and 5.2** in pairs in their workbooks.

3. Three Dimensional shapes

Teaching/Learning Approaches

Hands on approach using real life examples should be used. Tap into the learners' prior knowledge. They know ice cream cones, cups, boxes etc. Use these to make the topic relevant to the learner's everyday context.

Teaching/Learning Procedure

- a) Provide learners with models of 3-D shapes from the environment (or make them) and discuss their properties
- b) Discuss 3 – D shapes on page 75
- c) Consolidate by giving **Activity 5.3**

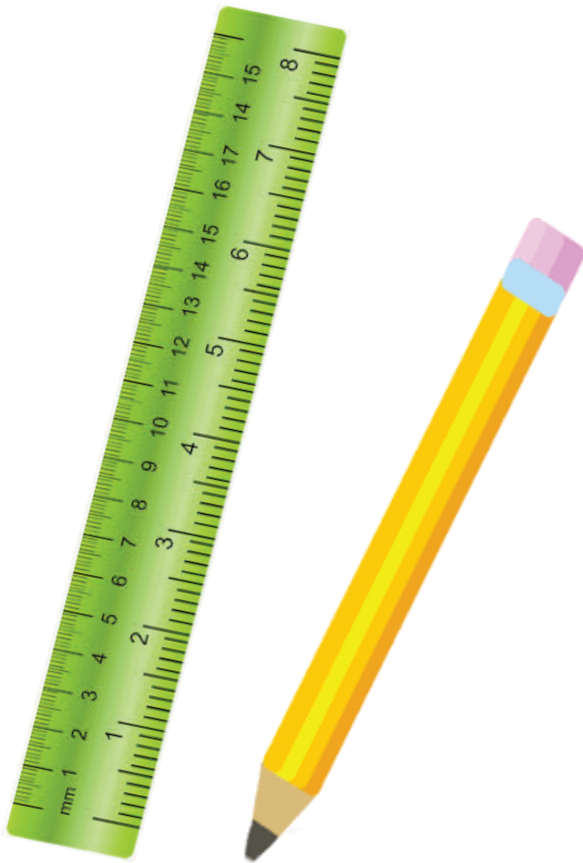
Unit Assessment

Ask learners to do the revision exercise given in the Learners' Workbook. Provide alternatives for those with special needs. Mark the revision exercise and give feedback to the learners. Correct any misconceptions and applaud good performance.

Unit

6

Measurement



Unit 6: Measurement

Learning Outcome 6

BTN01.6. Demonstrate knowledge of measurement using simple non-standard instruments in various contexts.

Evidence Requirements

Portfolio of evidence containing:

1. Measurements of students' height and weight conducted and recorded in pairs.
2. A list of important national days and a brief description of their importance to Botswana given by individual learners.
3. Facilitators' observation report on learners carrying out the measuring activity.

Performance Criteria

- BTN01.6.1.** Compare objects by length, height and area.
- BTN01.6.2.** Measure the length, height, area and weight of objects using non-standard instruments.
- BTN01.6.3.** Compare the capacity of different containers.
- BTN01.6.4.** Describe different times of the day by name and event.
- BTN01.6.5.** State days of the week, month and season.
- BTN01.6.6.** Identify national calendar events.

Range Statement

Use non-standard instruments for measuring: These should be varied and allow for creativity and authenticity.

Compare the capacity of containers: Using but not limited to comparative terms such as larger, bigger, more, smaller, less, the same.

Different times of the day should include morning, afternoon, evening, night and daytime.

Measurement

Comparing objects by lengths, height and area

Introduce the unit by discussing the picture in the Learner's Workbook showing measures in the community. Let the learners' discuss how measurement is used in real life situations.

Teaching/Learning Approaches:

Use group work for discussion, pair work and cooperative learning for consolidation and individual work for revision or unit assessment. Recognise prior learning as some of your mature learners may already know how to measure using standard measurement. If they already have skills in measurement, allow them to use standard measurement.

When organising group work, take cognisance of prior knowledge as you may want those who already know to assist those who don't or you may want them to proceed.

Teaching/Learning Procedure

Introduce the lesson and explain the lesson objectives and the rationale of the unit. Introduce the concept of long, longer and longest and the concept of short, shorter and shortest.

1. Length

- a) Discuss with learners what length and height is giving example of length of objects around them.
- b) Ask learners to discuss non-standard measurement units with reference to what is normally used to measure length and height e.g. strides (pace), arm length etc.
- c) Demonstrate how to measure length and height of things around them using non-standard measurement units.
- d) Provide learners with the opportunity to estimate and measure using non-standard measurement units.
- e) Discuss with learners why non-standard units are called “non-standard units”
- f) Ask the learners to list the lengths they know of. Ask them to tell you if the lengths are short or long. Let them record all these.

Activities

Ask the learners to do **Activities 6.1 and 6.2** in groups. Check to see if the learners have done the right thing or not and correct them.

2. Height

- a) Explain to the learners what height is and give them examples to understand. Examples such as; a man is taller than a baby, or a tree is taller than me.
- b) Ask them to list all the tall and short things around, correct them if there are inconsistencies.
- c) Give the learners Activity 6.3 to do as a group and supervise the work.

3. Mass

- a) Introduce mass by discussing key words “heavy” and “heavier”
- b) Hold out two objects and allow learners to guess which object they think is heavy or heavier.
- c) Repeat this activity with more objects.
- d) Consolidate by asking learners to do **activity 6.5**
- e) Give examples to clarify what mass is and help learners understand, i.e: a donkey’s mass is more than a goat because it is bigger and a goat is smaller.

4. Capacity

- a) Discuss with the learners what capacity is.
- b) Ask learners to bring different containers from home and allow them to compare capacity of two containers by observation.
- c) Using different containers, ask learners to estimate how many small containers can fill up the big container, then carry out the real activity.
- d) Consolidate by giving learning **activity 6.6** to do.

5. Area

Show the learners the difference between a large area and a small area. Give examples to help them understand. You can give an example such as; in a kraal, a bull sleeps on a larger area than a calf. Ask them to give you the things which occupy large and small areas and ask them to record that in their exercise books. Make sure the students know the correct unit of measure.

- a) Discuss with learners what area means.
- b) Provide learners with the opportunity to compare areas of different objects e.g. kraal, school, football ground.
- c) Consolidate by giving learners **activity 6.4**

6. Calendar

- a) Display a calendar on the board. Discuss with the learners how the calendar is organised and the information it communicates (days of the week, months of the year, and seasons of the year.)
- b) Practice days of the week by singing the song Monday, Tuesday, Wednesday, Thursday, Friday, Saturday and Sundays. Ask learners who know the song to sing and teach those who do not know the song. If none of the learners knows the song, teach them. Through questions find if they know the days of the week.
- c) Discuss learners' special days and holidays and ask them to identify them on the calendar
- d) Demonstrate to learners on how to write a date. The ask learners to write the date in which their special days holidays will fall this year.
- e) Consolidate by giving learners **activities 6.7, 6.8 and 6.9** to do.

7. Time

a) Day and Night

Tell the learners that we have days and nights and that during the day they go to school while their parents go to work. Ask them to tell you the different activities done during the day and at night. Write down all the activities and ask them to copy these down in their books.

Ask the learners to do Activities 6.7 and 6.8 in groups. Check to see if the learners are doing the right thing or not and correct them.

b) The clock

i) Introduce time by asking learners what they use to tell time. Display an analogue clock model with moving hands on the board.

ii) Discuss the components of the analogue clock.

iii) Discuss with learners how the hands move.






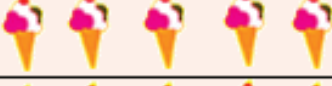

iv) Discuss with learners how to read time from an analogue clock in O'clock, quarter past and half past.

v) Consolidate by giving learners **activity 6.10**

Unit Assessment

Give learners individual work. Guide them where need arises.

Data Handling

Number of icecreams sold	
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	
Sunday	

Unit 7: Data Handling

BTN01.7. Demonstrate the skill of presenting information using tables and pictographs.

Evidence Requirements

- 1. A portfolio of evidence containing;**
 - a. A group display of pictographs showing different heights of learners. The evidence should not be restricted to height. Learners should record their own measurement and draw a simple pictograph. The pictograph is then given meaning

Performance Criteria

- BTN01.7. 1.** Collect information as raw data.
- BTN01.7.2.** Present the information as tables.
- BTN01.7.3.** Present information as pictographs.
- BTN01.7.4.** Interpret the information from tables and pictographs.

Range statement

Raw data to include recording and observing without manipulation.

Recording data in tabular form to include but not limited to pictographs.

Summarizing data to include use of tables, pictographs and frequencies.

Interpretation of tabular data should be limited to introducing the concept, interpreting data and the comparative concept of taller than and heavier than.

=====

Teaching /Learning Methods:

The topic lends itself to a lot of group work. Allow the learners to collect data, present the data and discuss the findings.

Class discussions should centre on the interpretation of the findings. The discussions and data collection, presentation should not be limited to this section only. They should be seen as tools for presenting data wherever necessary.

Procedure:

Recap on the previous lessons taught in class in Unit 1. Explain the lesson outcomes and state the rationale of the topics to be learnt in the class. Explain the difference between tables and pictographs. Make sure that you have a diagrammatic representation of a table and a pictogram.

Tables

Explain what a table is to the learners. Bring the diagrammatic representation of a table and let the learners interpret it. Ask them what they see in the table and ask them questions. Correct their answers and guide them accordingly.

Give the learners **Activity 7.1**, question 1 to help them understand more.

Grade their work and help them make corrections.

Pictographs

Explain what a pictograph is to the learners, show any differences to a table. Bring the diagrammatic representation of a table and let the students interpret it. Ask them what they see in the table and ask them questions. Correct their answers and guide them accordingly.

Give them **Activity 7.1**, question 2 to help them understand more. Grade their work and help them make corrections.

Conclude the lesson by asking the learners what they are able to do and list all they are able to do; that they now know the differences between a table and a pictograph and how to interpret data on tables and pictographs.

Unit Assessment

Assess the unit by allowing them to choose their topic and collecting data and presenting. Do not limit them as some of them could be more mature and would like to use the table and pictographs for compiling their own materials.

Grade the material once they are through. Do not focus on the beauty of the representation but on whether the learners have understood the concepts and gained the skill of data collection and simple interpretation

End of Module Revision Test

End of Module Revision Test

- Write the following numbers using numerals
 - Eleven _____
 - Twenty one _____
 - Sixteen _____
 - Seventeen _____
- Look around you and write the colours of the following:
 - Your top _____
 - Your jersey _____
 - Your neighbours shoes _____
- Order the following numbers from largest to smallest
 - 12, 3, 11, 17, 0 _____
- Write the missing numbers in the spaces provided below;
 - 1, 2, __ , 4, 5, __
 - 22, 20, __ , 16, 14, __
- Write the place value of 3 in the numbers below;
 - 300 _____
 - 123 _____
 - 131 _____

6. Answer the following as true or false
- A dog is bigger than a cat: _____
 - 5 is smaller than 3: _____
 - $10 + 2$ is smaller than 20: _____

7. Write the answer below as even or odd.
- 11 is an ____ number.
 - 4 is an ____ number.
 - 15 is an ____ number
 - 1 is an ____ number.
 - 21 is an ____ number.

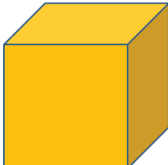
8. Work out answers to the following;
- $2 \times 2 =$ _____
 - $2 + 3 + 1 =$ _____
 - $12 - 10 =$ _____
 - $10 \div 2 =$ _____

9. Two halves make? _____

10.  _____ = _____

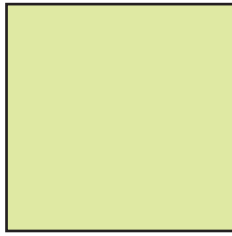
The image shows a 10 Botswana Pula banknote on the left and a 5 Botswana Pula coin on the right. The banknote is yellow and green with 'SPECMEN' written in blue. The coin is gold and silver with '5' in the center.

11. Name the following:

a.  = _____

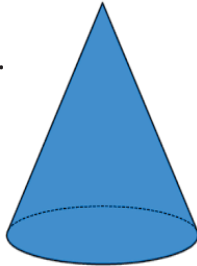
The image shows a 3D yellow cube.

b.



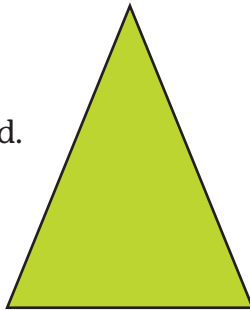
= _____

c.



= _____

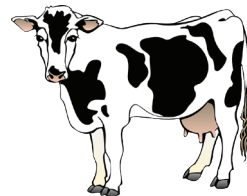
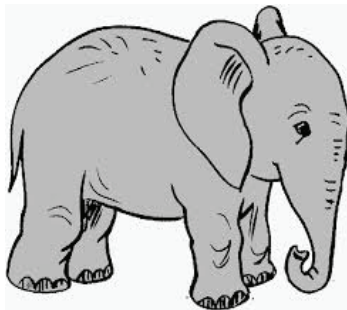
d.



= _____

12. Which of the following covers a large area?

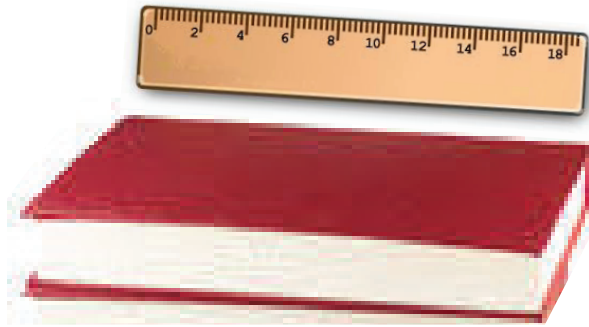
a.



b.



c.



13. How many days are there in a week?

14. How many days are there in a month?

15. During the night we see _____

16. There are four seasons in a year, which are: _____

17. Name the different types of lines you know.

18. Write the following numbers in numerals

- a. Four _____
- b. Seven _____
- c. Sixteen _____

19. How many hours are there in a day? _____

20. How many minutes are there in an hour? _____