

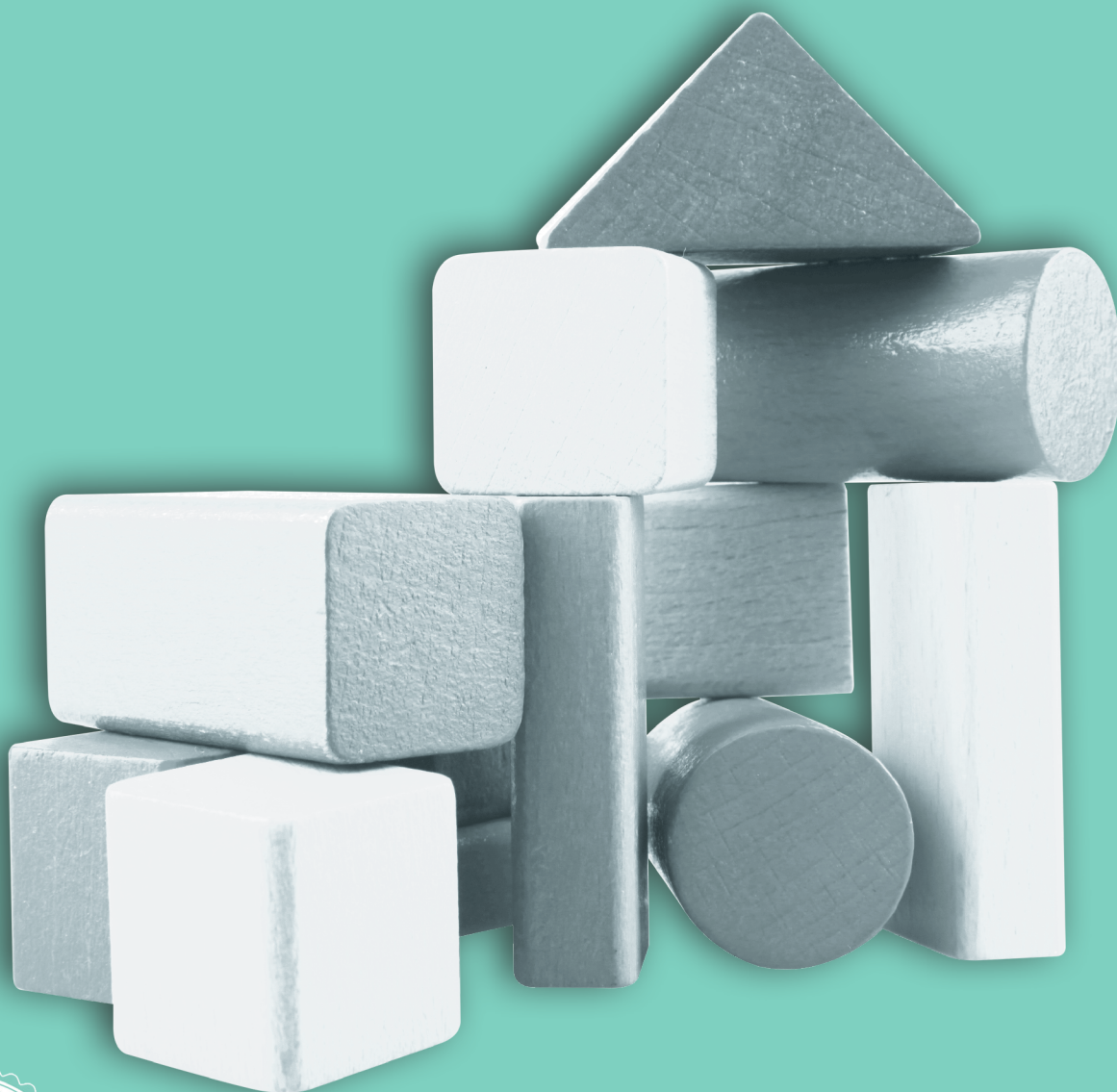
ESSENTIAL



# Mathematics

## Primary 3

Teacher's Guide



CAMBRIDGE



# ESSENTIAL Mathematics Primary 3

Teacher's Guide

Adwoa Nkrumah • Vida Takyi • Samuel Oppong Jnr  
Mathematical Association of Ghana



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## Modules and Lessons Organisation

Strand 1: Number Sub-strand 1: Number: Counting, Representation, Cardinality & Ordinality				
Module	Lessons	LB page numbers	WB page numbers	TG page numbers
<b>Module 1:</b> Number Names	<b>Lesson 1:</b> Reading and writing number names (1,000 – 5,000) <b>Lesson 2:</b> Reading and writing number names (5,000 – 10,000)	8 - 10	2 - 4	2 3
<b>Module 2:</b> Counting Sequence (1)	<b>Lesson 1:</b> Counting forwards by 10's up to 1000 <b>Lesson 2:</b> Counting backwards by 10's up to 1000 <b>Lesson 3:</b> Counting forwards by <b>Lesson 4:</b> Skip count backwards by 50s up to 1000	11 - 16	5 - 7	4 5 5 6
<b>Module 3:</b> Counting sequences (2)	<b>Lesson 1:</b> Counting forwards by 10's up to 5,000. <b>Lesson 2:</b> Counting backwards by 100s up to 5,000. <b>Lesson 3:</b> Counting forwards by 500's up to 10,000. <b>Lesson 4:</b> Counting backwards by 500s up to 10,000s <b>Lesson 5:</b> Counting forwards by 1000s to 10,000 <b>Lesson 6:</b> Counting backwards by 1000s up to 10,000.	17 - 21	8 - 10	7 8 8 - 9 9 9 - 10 10
<b>Module 4:</b> Estimating quantities	<b>Lesson 1:</b> Estimating number of objects in groups"	22 - 25	11 - 14	11
<b>Module 5:</b> Representing numbers or quantities with numerals	<b>Lesson 1:</b> Representing quantities with numerals.	26 - 28	15 - 18	12
<b>Module 6:</b> Writing number names	<b>Lesson 1:</b> Writing number names for multiples of 10. <b>Lesson 2:</b> Writing number names for multiples of 100	29 - 34	19 - 20	13 14
<b>Module 7:</b> Describing the position of numbers	<b>Lesson 1:</b> Describing position of numbers	35 - 37	21 - 22	15

<b>Module 8:</b> Relationship between numbers up to 5000	<b>Lesson 1:</b> Finding the relationship between numbers (using multi-base-block) <b>Lesson 2:</b> Finding the relationship between numbers (using abacus)	38 - 44	23 - 27	17 18
<b>Module 9:</b> Relationship between numbers up to 10,000	<b>Lesson 1</b> Describing numbers (1 – 5000) using multi-base block. <b>Lesson 2:</b> Describing numbers (5,000 – 10,000) using multi-based block	45 - 50	28 - 32	19 20
<b>Module 10:</b> Finding values of digits in numbers	<b>Lesson 1</b> Finding values of digits in a given number <b>Lesson 2:</b> Reading numbers up to 1,000	51 - 54	33 - 34	21 22
<b>Module 11:</b> Decomposing numbers	<b>Lesson 1:</b> Decomposing numbers (up to 5,000) <b>Lesson 2:</b> Decomposing numbers (up to 10,000)	55 - 57	35 - 37	23 24
<b>Module 12:</b> Comparing and ordering whole numbers (1)	<b>Lesson 1:</b> Describing the relative size of numbers <b>Lesson 2:</b> Comparing 2 numbers using the symbols $<$ , $>$ and $=$	58 - 61	38 - 39	25 26
<b>Module 13:</b> Comparing and ordering whole numbers (2)	<b>Lesson 1:</b> Ordering numbers <b>Lesson 2:</b> Ordering numbers using the number line <b>Lesson 3:</b> Ordering numbers using Place Value	62 - 68	40 - 42	27 28 - 29 28
<b>Module 14:</b> Comparing and ordering whole numbers (3)	<b>Lesson 1:</b> Finding missing numbers using the number line <b>Lesson 2:</b> Finding missing numbers using charts	69 - 72	43 - 45	30 31
<b>Module 15:</b> Comparing and ordering whole numbers (4)	<b>Lesson 1:</b> Comparing quantities using word problems	73 - 74	46 - 48	32
<b>Module 16:</b> Positive and negative number representation	<b>Lesson 1:</b> Positive and negative numbers	75 - 77	49 - 51	33
<b>Module 17:</b> Describing situations using positive and negative values	<b>Lesson 1:</b> Positive and negative numbers	78 - 80	52 - 53	34
<b>Module 18:</b> Counting forwards and backwards	<b>Lesson 1:</b> Counting forwards through zero (0). <b>Lesson 2:</b> Counting backwards through zero (0)	81 - 84	54 - 58	35 36

<b>Strand 1: Number</b> <b>Sub-Strand 2 Number: Operations (Addition, Subtraction, Multiplication and Division)</b>				
<b>Module</b>	<b>Lessons</b>	<b>LB page numbers</b>	<b>WB page numbers</b>	<b>TG page numbers</b>
<b>Module 1:</b> Addition and subtraction facts (fluency 1)	<b>Lesson 1:</b> Finding unknown in addition sentence <b>Lesson 2:</b> Finding unknown in subtraction sentences	88 - 91	59 - 61	37 38
<b>Module 2:</b> Addition and subtraction facts (fluency 2)	<b>Lesson 1:</b> Addition (using decomposition strategy). <b>Lesson 2:</b> Addition (using friendly jumps strategy).	92 - 96	62 - 65	39 40
<b>Module 3:</b> Addition & subtraction constant standard	<b>Lesson 1:</b> Using the symbols = and $\neq$ to make sentences true (1) <b>Lesson 2:</b> Using the symbols = and $\neq$ to make sentences true (2)	97 - 101	66 - 68	41 42
<b>Module 4:</b> Relationship between Addition and Subtraction	<b>Lesson 1:</b> Changing addition sentence into subtraction sentence <b>Lesson 2:</b> Changing subtraction sentence into addition sentence	102 - 105	69 - 70	43 44
<b>Module 5:</b> Addition Strategies (1)	<b>Lesson 1:</b> Making addition facts	106 - 107	71 - 73	45
<b>Module 6:</b> Addition Strategies (2)	<b>Lesson 1:</b> Making double to add <b>Lesson 2:</b> Making doubles or friendly numbers to add	108 - 110	74 - 77	46 47
<b>Module 7:</b> Addition strategies (3)	<b>Lesson 1:</b> Making 10s to add <b>Lesson 2:</b> Addition (using decomposition) <b>Lesson 3:</b> Addition (using 10s column first)	111 - 114	78 - 81	48 49 49
<b>Module 8:</b> Subtraction strategies (1)	<b>Lesson 1:</b> Subtraction (using doubles) <b>Lesson 2:</b> Subtraction (using decomposition) <b>Lesson 3:</b> Subtraction (using compensation strategy)	115 - 118	82 - 86	50 51 51
<b>Module 9:</b> Subtraction Strategies (2)	<b>Lesson 1:</b> Subtraction using compensation <b>Lesson 2:</b> Subtraction (using friendly jumps)	119 - 123	87 - 90	52 53



<b>Module 10:</b> Addition of two 2-digit and two 3-digit numbers	<b>Lesson 1:</b> Addition of two 2-digit numbers <b>Lesson 2:</b> Addition of three 3-digit numbers	124 - 129	91 - 96	54 55
<b>Module 11:</b> Subtraction of two 2-digit and two 3-digit numbers	<b>Lesson 1:</b> Subtraction of two 2-digit numbers <b>Lesson 2:</b> Subtraction of two 3-digit numbers	130 - 134	97 - 100	56 57
<b>Module 12:</b> Addition of whole numbers (1)	<b>Lesson 1:</b> Adding two 2-digit numbers. <b>Lesson 2:</b> Adding 2-digit to 3-digit numbers <b>Lesson 3:</b> Adding 3-digit numbers	135 - 139	101 - 103	58 59 59
<b>Module 13:</b> Addition of whole numbers (2)	<b>Lesson 1:</b> Addition of whole numbers (using “making 10s and 100s”) <b>Lesson 2:</b> Addition of whole numbers (using compensation strategy)	140 - 143	104 - 108	60 61
<b>Module 14:</b> Subtraction of whole numbers (1)	<b>Lesson 1:</b> Subtraction of whole numbers (using decomposition strategy) <b>Lesson 2:</b> Subtraction of whole numbers (using counting up by friendly jumps strategy)	144 - 149	109 - 113	62 63
<b>Module 15:</b> Subtraction of whole numbers (2)	<b>Lesson 1:</b> Subtraction of whole numbers (using compensation strategy) <b>Lesson 2:</b> Subtraction of whole numbers (using constant difference)	150 - 153	114 - 116	64 65
<b>Module 16:</b> Word problems involving addition and subtraction	<b>Lesson 1:</b> Addition word problems (using estimation strategy) <b>Lesson 2:</b> Subtraction word problems (using estimation strategy)	154 - 161	117 - 122	66 - 67 67
<b>Module 17:</b> Commutative property of addition	<b>Lesson 1:</b> Commutative property of addition.	162 - 164	123 - 125	68
<b>Module 18:</b> Multiplication (1)	<b>Lesson 1:</b> Multiplication (using equal groupings)	165 - 169	126 - 129	69
<b>Module 19:</b> Multiplication (2)	<b>Lesson 1:</b> Multiplication (using arrays of dots) <b>Lesson 2:</b> Multiplication (using the lattice strategy)	170 - 174	130 - 132	70 - 71 71



<b>Module 20:</b> Multiplication (3)	<b>Lesson 1:</b> Multiplication (using the number line) <b>Lesson 2:</b> Multiplication (using the number chart) <b>Lesson 3:</b> Multiplication game	175 - 180	133 - 135	72 73 73
<b>Module 21:</b> Multiplication (4)	<b>Lesson 1:</b> Multiplication (using repeated addition)	181 - 183	136 - 139	74 - 75
<b>Module 22:</b> Division 1	<b>Lesson 1:</b> Division by sharing <b>Lesson 2:</b> Division by grouping	184 - 189	140 - 146	76 76 - 77
<b>Module 23:</b> Division (2)	<b>Lesson 1:</b> Division (using repeated subtraction)	190 - 194	147 - 148	78
<b>Module 24:</b> Division (3)	<b>Lesson 1:</b> Division (using inverse multiplication)	195 - 198	149 - 150	79

**Strand 1: Number**  
**Sub-Strand 3: Fractions**

Module	Lessons	LB page numbers	WB page numbers	TG page numbers
<b>Module 1:</b> Unit fractions	<b>Lesson 1:</b> Unit fractions (1) <b>Lesson 2:</b> Unit fractions (2)	202 - 205	151 - 152	80 81
<b>Module 2:</b> Multiples of unit fractions	<b>Lesson 1:</b> Multiples of unit fractions (1) <b>Lesson 2:</b> Multiples of unit fractions (2)	206 - 208	153 - 156	82 83
<b>Module 3:</b> Fraction of a group	<b>Lesson 1:</b> Fraction of a group (1) <b>Lesson 2:</b> Fraction of a group (2)	209 - 211	157 - 159	84 85
<b>Module 4:</b> Compare and order unit fraction	<b>Lesson 1:</b> Comparing fractions with the same denominator	212 - 214	160 - 163	86

Strand 1: Number Sub-Strand 4 Money				
Module	Lessons	LB page numbers	WB page numbers	TG page numbers
<b>Module 1:</b> Paying the exact amount	<b>Lesson 1:</b> Paying the exact amount (1) <b>Lesson 2:</b> Paying the exact amount (2) <b>Lesson 3:</b> Paying the exact amount (3)	217 - 221	164 - 169	88 89 89
<b>Module 2:</b> Taking change	<b>Lesson 1:</b> Taking change (1) <b>Lesson 2:</b> Taking change (2)	222 - 225	170 - 173	90 91

Strand 2: Algebra Sub-Strand 1: Patterns and Relationship				
Module	Lessons	LB page numbers	WB page numbers	TG page numbers
<b>Module 1:</b> Increasing and decreasing patterns	<b>Lesson 1:</b> Identify pattern rule for a given pattern <b>Lesson 2:</b> Creating a pattern for a given rule	228 - 231	174 - 176	94 - 95 95
<b>Module 2:</b> Errors in patterns	<b>Lesson 1:</b> Identify errors in a pattern.	232 - 234	177 - 178	96
<b>Module 3:</b> Increasing and Decreasing Pattern (100 chart)	<b>Lesson 1:</b> Locating and describing patterns	235 - 239	179 - 180	97

Strand 3: Geometry and Measurement Sub-Strand 1 2D shapes and 3D objects				
Module	Lessons	LB page numbers	WB page numbers	TG page numbers
<b>Module 1:</b> Describing solid shapes (1)	<b>Lesson 1:</b> Describing solid shapes (2) <b>Lesson 2:</b> Attributes of a cylinder, a cube and a cuboid <b>Lesson 3:</b> Attributes of a sphere and a cone <b>Lesson 4:</b> Attributes of a triangular pyramid and rectangular prism	242 - 245	182 - 184	100 101 101 101 - 102
<b>Module 2:</b> Regular and irregular shapes	<b>Lesson 1:</b> Regular and irregular shapes (1) <b>Lesson 2:</b> Regular and irregular shapes (2)	246 - 248	186 - 188	103 104

<b>Module 3:</b> Angles	<b>Lesson 1:</b> Angles (1) <b>Lesson 2:</b> Angles (2)	249 - 251	188 - 189	105 105 - 106
<b>Module 4:</b> Angles that are right angles	<b>Lesson 1:</b> Angles that are right angles (1) <b>Lesson 2:</b> Angles that are right angles (2)	252 - 254	190 - 191	107 108
<b>Module 5:</b> Quadrilaterals	<b>Lesson 1:</b> Quadrilaterals (1) <b>Lesson 2:</b> Quadrilaterals (2)	255 - 257	192 - 194	109 110

**Strand 3: Geometry and Measurement**  
**Sub-Strand 2 Position/Transformation**

Module	Lessons	LB page numbers	WB page numbers	TG page numbers
<b>Module 1:</b> Position of objects	<b>Lesson 1:</b> Position of objects (1) <b>Lesson 2:</b> Position of objects (2)	260 - 262	195 - 196	111 111 - 112

**Strand 3: Geometry and Measurement**  
**Sub-Strand 3: Measurement – Length, Mass Capacity and Time**

Module	Lessons	LB page numbers	WB page numbers	TG page numbers
<b>Module 1:</b> Measurement of length	<b>Lesson 1:</b> Measurement of length (1) <b>Lesson 2:</b> Measurement of length (2)	264 - 266	197 - 198	113 113 - 114
<b>Module 2:</b> Measurement of length (relationship between cm and m)	<b>Lesson 1:</b> Measurement of length using a cm rule (1) <b>Lesson 2:</b> Measurement of length using a cm rule (2)	267 - 268	199 - 200	115 116
<b>Module 3:</b> Measurement of length (relationship between cm and m)	<b>Lesson 1:</b> Measurement of length (relationship between cm and m)	269 - 270	201	117
<b>Module 4:</b> Perimeter	<b>Lesson 1:</b> Perimeter of regular shapes <b>Lesson 2:</b> Perimeter of irregular shapes	271 - 273	202 - 204	118 119
<b>Module 5:</b> Measuring of Mass (relationship kilogram and gram; litres and millilitres)	<b>Lesson 1:</b> Measuring mass (relationship between grams and kilograms) <b>Lesson 2:</b> Measuring volume (relationship between litres and milliliters)	274 - 278	205 - 206	120 - 121 121

<b>Module 6:</b> Estimating mass and volume	<b>Lesson 1:</b> Estimating mass <b>Lesson 2:</b> Estimating volume	279 - 283	207 - 208	122 123 - 124
<b>Module 7:</b> Measurement of time	<b>Lesson 1:</b> Measurement of time (1) <b>Lesson 2:</b> Measurement of time (2)	284 - 286	209 - 213	125 - 126 126 - 127
<b>Module 8:</b> Reading the calendar	<b>Lesson 1:</b> Reading the months of the year <b>Lesson 2:</b> Reading days and weeks of the month	289 - 292	214 - 217	128 - 129 129
<b>Module 9:</b> Relationship between times	<b>Lesson 1:</b> Relationship between seconds and minutes <b>Lesson 2:</b> Relationship between minutes and hours; hours and days <b>Lesson 3:</b> Relationship between days and weeks; months and year	293 - 295	218 - 219	130 - 131 131 - 132 131

**Strand 4: Data****Sub-Strand 1: Data Collection, Organization, Interpretation, Presentation and Analysis**

<b>Module</b>	<b>Lessons</b>	<b>LB page numbers</b>	<b>WB page numbers</b>	<b>TG page numbers</b>
<b>Module 1:</b> Gathering and organizing data	<b>Lesson 1:</b> Collecting and organizing Data (1) <b>Lesson 2:</b> Collecting and organizing Data (2)	300 - 303	222 - 224	134 135
<b>Module 2:</b> Drawing and interpreting graphs	<b>Lesson 1:</b> Drawing Concrete graph and pictograph <b>Lesson 2:</b> Drawing bar graph <b>Lesson 3:</b> Interpretation of graphs	304 - 311	225 - 227	136 137 137 - 138

## INTRODUCTION

The aim of the primary Mathematics curriculum is to provide learners with opportunities to further their Mathematical knowledge and skills and ensure that they develop the attitudes and dispositions required to be successful Mathematics learners.

The revised Mathematics curriculum is standards-based that seeks to equip learners with the requisite skills needed to do Mathematics in ways that is enjoyable and easy. The standards-based curriculum drives on the development of strong concepts, critical thinking skills and problem-solving abilities and capabilities. The Teacher's Guide with its accompanying learners' book and workbook offers full coverage of the 2019 Standards-based Mathematics curriculum for primary schools with a problem-solving and inquiry-based approach to the learning of Mathematics.

Each lesson is based on a '**Big Idea**', providing an engaging, exciting theme which is endorsed in a real-life context. The 'Big Ideas' are meticulously presented using the scaffolding and differentiated strategies to accommodate diverse learners in the Ghanaian classroom. Activities, exercises and investigations provide opportunities for learners to apply their knowledge, skills and understanding of the Mathematics they are learning. The series also offer additional teaching and learning resources and mental maths games to support teaching and extend learning.

This material supports teachers in planning and delivering successful Mathematics lessons. It provides a clear understanding of learners' pre-requisite skills through "Starters" and "Find out" activities before introducing new concepts. Through its reinforcement activities in the form of "Starters", regular revisiting and extension of previous learning is emphasized to ensure better understanding of concepts before new ones are introduced.

### Organisation of the curriculum

The curriculum is organised under Strands, Sub-strands, Content standards, Indicators and exemplars.

- **Strands** are the broad areas/sections of the Mathematics curriculum to be studied.
- **Sub-strands** are larger groups of related indicators. Indicators from sub-strands may sometimes be closely related.
- **Content Standards** refers to the pre-determined level of knowledge, skill and/or attitude that a learner attains by a set stage of education.
- **Indicators** is a clear outcome or milestone that learners have to exhibit in each year to meet the content standard expectation. The indicators represent the minimum expected standard in a year.
- **Exemplars** refers to support and guidance which clearly explains the expected outcomes of an indicator and suggests what teaching and learning activities could take, to support the facilitators/teachers in the delivery of the curriculum.

This Teacher's Guide and its accompanying Learner's Book are organized under four strands and nine sub-strands:

- **Strand 1:** Number (Counting, Representation and Cardinality) Operations and Fractions.
  - Sub-strand 1: Numbers: (Counting, Representation and Cardinality)
  - Sub-strand 2: Numbers: (Operations)
  - Sub-strand 3: Fractions Representation and Relationship
  - Sub-strand 4: Money
- **Strand 2:** Algebra
  - Sub-strand 1: Patterns and Relationships
- **Strand 3:** Geometry and Measurement
  - Sub-strand 1: 2D and 3D Shapes
  - Sub-strand 2: Position and Transformation
  - Sub-strand 3: Measurements — Length, Mass, Capacity and Time
- **Strand 4:** Data
  - Sub-strand 1: Data (Collection, Presentation, Analysis and Interpretation)

## Time allocation

For adequate coverage of the curriculum, the following time allocation is advised for Basic 3: ten periods a week, 30 minutes per period. It is recommended that the teaching periods be divided as follows: 2 periods per day (two, 30-minute periods).

## Classroom management

Most teachers in Ghana are working with large classes, and are skilled in large-class methodology. Here are a few reminders about group, pair and individual work that could be helpful with large classes.

### Group work

Many of the activities, especially, those related to listening and speaking are done in groups. Group work needs to be carefully planned and used thoughtfully. For group work to be successful, the whole class has to be well behaved. Therefore it is important for you to set very definite ground rules.

- Learners must listen to each other.
- They must give all group members the opportunity to share their ideas.
- They must be polite and courteous.
- Tell learners exactly how loudly they are expected to talk.
- Inform them as to whether they are allowed to get up out of their seats or not.
- Make them aware of the consequences if they do not adhere to the ground rules.
- It is usually best to remove them from the group and for them to complete the activity on their own.
- Have signals that will tell your learners that the activity is coming to an end or the noise level is getting too loud, for example, flicker the lights on and off or ring a bell. It is best not to use your voice as you will end up shouting to be heard above the group discussions.

Circulate and supervise. This is not free time for you. You need to listen to discussions, check if groups have understood the instructions and conduct informal assessments.

Vary groups. Three to five members per group is ideal. If groups are too large, you will usually find someone not participating.

### Pair work

Learners are often instructed to work in pairs – either with their desk mate, or with a partner. This is an ideal opportunity for learners to assist each other, and for them to assess each other.

- Working with a desk mate offers the least classroom disturbance. The learners are already seated side-by-side. They ask and answer questions during Picture talk, and they discuss the readings before they write comprehension answers individually.
- Working with a partner that you have allocated to the learner means that you can pair a slower learner with a faster learner, so that they can help one another. You may also choose to pair learners of similar abilities together, so that they can proceed more quickly with the work, while you assist the slower pairs.

### Individual work

Individual work usually follows a group discussion, or a reading by you, the teacher. The learner will by this stage, be familiar with the vocabulary required for the individual work, and will usually have been involved in a discussion about the text. This means that he or she is now ready to work alone, and answer comprehensive questions.

While learners are working individually, walk around the classroom, checking what they are doing, and offering help where it is needed.

## Learning areas (Strands)

### Strand 1: Number

Number and number sense takes a bigger part of the entire B1 curriculum. It forms 64% of the curriculum. An understanding of number extends beyond mere recognition of number and counting. Learners are required to develop a conceptual understanding of number. That is, they understand the value of each number and can describe the relationship between numbers.



Learners should be able to solve everyday problems with their number sense.

Learners who have number sense know that there are not enough toffees for everyone if there are four toffees to be shared among five learners. Also,  $95 > 59$  and  $59 < 95$ . Conceptual understanding of number is the major building blocks of Mathematics.

Besides, conceptual understanding of number operations goes well beyond memorizing basic facts and the steps to follow when adding, subtracting, multiplying or dividing numbers or fractions. It involves combining both the procedural and conceptual understanding to demonstrate what it means to add, subtract, multiply and divide, and the effect that these operations have on numbers.

Again, an important requirement of the standards-based curriculum involves encouraging learners to develop personal strategies that are accurate and flexible to compute. Developing personal strategies for adding, subtracting, multiplying and dividing as well as developing a variety of strategies for computing mentally (without pencil and paper) and for making reasonable mental estimations is an important requirement by the curriculum.

Further, number emphasizes on the development of conceptual understanding of place value, particularly in early primary. Given that place value is a foundational concept, the learning outcomes have been revised to embed an explicit focus on the development of place value understandings. Learners are required to use manipulatives to demonstrate an understanding of place value of numbers by telling the meaning of each digit in a given 2-digit number (when the two digits are different, as well as when the two digits are the same) and explaining why the value of a digit depends upon its placement within a numeral. Number also requires learners to recognise Ghanaian coins by name, including one pesewa, five pesewas, ten pesewas, twenty pesewas, fifty pesewas, one cedi, and two cedis by value and describe the relationship among them.

### Strand 2: Algebra

Mathematics is often regarded as the science of patterns. When solving a complex problem, we frequently suggest to learners that they try to work on simpler versions of the problem, observe what happens in a few specific cases — that is, look for a pattern — and use that pattern to solve the original problem.

Algebra is about recognizing, describing and working with patterns. The standards-based curriculum requires Basic 3 learners to begin recognizing and describing relationships, and eventually, extending given patterns and creating their own patterns. It involves learners working in pairs or groups to explore repeating visual or shape patterns, action patterns and number patterns. This pattern-based thinking, using patterns to analyze and solve problems, is an extremely powerful tool for doing Mathematics. Learners who are comfortable looking for patterns and then analyzing those patterns to solve problems can also develop understanding of new concepts in the same way. Most of the major principles of Algebra emerge as generalizations of patterns in number and shape. It is therefore expected that as they move through the grade levels, learners use their understanding of patterns to describe the relationship among numbers.

This Teachers' guide meticulously guides the Mathematics teacher to help learners recognize, generalize, and use patterns that exist in numbers, in shapes, and in the world around them. Learners who have such skills are better problem solvers, have a better sense of the uses of Mathematics, and are better prepared for work with algebraic functions and they move to higher grade levels than those who do not.

### Strand 3: Geometry and Measurement

The standards-based curriculum requires learners to develop an understanding of the 3D objects and 2D shapes in their environment and classrooms. This includes recognizing the features or attributes that distinguish different shapes and objects from each other, as well as recognizing what attributes can be measured and how to measure them. It also involves



building personal referents for key standard measure of lengths, mass, capacity, area and volume and using these references to estimate measures. This Teacher's Guide aids teachers to employ broad array of tasks that are based on learning trajectories with varied examples and non-examples, nurtures visual cognition with progression towards analytical thinking, and integrates rich and diverse maths communication.

#### Strand 4: Data

Mathematics is about describing and explaining relationships, including the relationships in data, and describing those relationships symbolically, orally or in written form. In primary, learners develop these understandings by collecting, interpreting and presenting data and making decisions based on data collected.

The major question that this Teacher's Guide seeks to answer is that "What are the important concepts involved in data collection and data use in the primary classroom, and how can teachers support the Mathematics of data?" And this "Guide" helps teachers to teach the underlying concepts that learners need to grasp in order to make use of the data they collect, to understand the questions they are trying to answer, to represent the data, and, finally, to interpret it.

### Assessment

Assessment is a process of collecting and evaluating information about learners and using the information to make decisions to improve their learning. In this curriculum, it is suggested that assessment is used to promote learning. Its purpose is to identify the strengths and weaknesses of learners to enable teachers ascertain their learner's response to instruction.

#### Forms of Assessment

Assessment in the curriculum is both **formative** and **summative**.

#### Formative assessment

refers to a wide variety of methods that teachers use to conduct in-process evaluations of student comprehension, learning needs, and academic progress during a lesson, unit, or

course. Formative assessments help teachers identify concepts that students are struggling to understand, skills they are having difficulty acquiring, and addressing these challenges.

Assessment "**for**", "**as**" and "**of**" learning  
Formative assessment is viewed in terms of Assessment as learning and Assessment for learning.

#### Assessment as learning

Assessment as learning relates to engaging learners to reflect on the expectations of their learning. Information that learners provide the teacher forms the basis for refining teaching-learning strategies. Learners are assisted to play their roles and to take responsibility of their own learning to improve performance. Learners are assisted to set their own goals and monitor their progress.

#### Assessment for learning

It is an approach used to monitor learner's progress and achievement. This occurs throughout the learning process. The teacher employs assessment for learning to seek and interpret evidence which serves as timely feedback to refine their teaching strategies and improve learners' performance. Learners become actively involved in the learning process and gain confidence in what they are expected to learn.

#### Assessment of learning

This is **summative assessment**. It describes the level learners have attained in the learning, what they know and can do over a period of time. The emphasis is to evaluate the learner's cumulative progress and achievement.

### Core competencies

As part of the new Standards-based curriculum, a number of core values have been identified to be imbued into learners. They are ways in which teachers and learners in Mathematics engage with the subject matter as they learn the subject. **The series** adopts various learning activities that enable these core competencies to be well-developed in learners. Through the use of group and pair activities, learners develop team spirit

and communication skills. Resources suggested for lessons offer learners the opportunity to develop their digital literacy skills too.

The six core competencies identified for all Ghanaian learners are:

### Critical thinking and Problem Solving (CP)

This promote self-directed thinking that produces new and innovative ideas in solving problems, reflecting critically on learning experiences and processes and making effective decisions. **The series** encourages learners to draw on their own experiences to analyse situations and choose the most appropriate out of a number of possible ways of arriving at a solution.

### Creativity and Innovation (CI)

Promoting economic and social entrepreneurship; imagining and pursuing novel ideas, judging value, developing innovation and curiosity. **The series** offers learners the opportunity develop their own personal and effective strategies to solve problems.

### Communication and Collaboration (CC)

This competence promotes in learners the skills to make use of languages, symbols and texts to exchange information about themselves and their life experiences. Learners actively participate in sharing their ideas. They engage in dialogue with others by listening to and learning from them. They also respect and value the views of others. **The series** recognizes that communicating one's ideas about Mathematics is an essential process for learning Mathematics. When young learners communicate their understandings (or their misunderstandings), they reflect upon, expand and often clarify their ideas and understanding of number quantities and the relationship between them.

For that reason, the lessons in **the series** have been designed such that it include explicit opportunities for learners to discuss their own understandings, and to hear and react to the mathematical understanding of other learners. Learners are asked to use oral, visual and written forms (e.g., objects, pictures, diagrams, words, symbols) to express their thinking and to share that thinking with others.

They are expected to explain or justify solutions, and use appropriate mathematical conventions and vocabulary when doing so.

### Cultural Identity and Global Citizenship (CG)

This competence involves developing active globally aware citizens who have the skills, knowledge and motivation to address issues of human and environmental sustainability. Developing an understanding of what it means to be a citizen of Ghana and its values. **The series** offers learners the opportunity to develop a Ghanaian identity through the use of examples and resources that are of Ghanaian origin and inculcate in learners the spirit of appreciation for what is made in Ghana.

### Personal Development and Leadership (PL)

This competence involves improving self-awareness and building self-esteem. It also entails identifying and developing talents, fulfilling dreams and aspirations. Learners are able to learn from mistakes and failures of the past. They acquire skills to develop other people to meet their needs. It involves recognising the importance of values such as honesty and empathy, and seeking the well-being of others. PL helps them acquire the skill of leadership, self-regulation and responsibility necessary for lifelong learning. **The series** imbues this core value in learners through the use of group works and presentations.

### Digital Literacy (DL)

Digital Literacy develops learners to discover, acquire and communicate through ICT to support their learning. It also makes them use digital media responsibly. **The series** offers learners the opportunity to use ICT tools to make learning of Mathematics interesting.

## Expectations of a Basic 3 Mathematics learner

Teachers are to focus on the four critical areas of the B3 curriculum, and in doing so, they have to achieve all the content standards through the indicators.

Teachers should ensure that B3 math learners will have strong conceptual and procedural understandings of foundations of math and be able to:

**NUMBER*****Number: Counting, Representation, Cardinality & Ordinality***

- Use number names and the counting sequence to count and estimate quantities up to 10,000.
- Identify numbers in different positions around a given number in a number chart.
- Describe numbers and the relationship between numbers from 0 to 10,000 in equivalent ways using the place value concept.
- Compare and order whole numbers up to 10,000 and represent comparisons using the symbols  $>$ ,  $<$ , or  $=$ .
- Describe situations having opposite directions or values.
- Use real life contexts to deduce positive and negative number representations
- Describe situations using positive and negative values.
- Count forwards and backwards with positive and negative whole numbers through zero.

***Number Operations***

- Use standard strategy or procedure to do addition or subtraction within 1000.
- Use the concept of "equal to" and "not equal to".
- Use strategies to mentally add and subtract whole numbers within 100.
- Use a variety of personal strategies for adding within 1000.
- Use a variety of personal and standard strategies to solve different types of subtraction and addition equations and problems with missing numbers in all positions.
- Use strategies to mentally add and subtract whole numbers within 100.
- Develop and explain estimation strategies to estimate the solution for a given word problem involving addition or subtraction with sum up to 1000.
- Show an understanding of the property of commutativity.
- Represent and explain multiplication using equal groupings.

- Represent and explain multiplication using rectangular arrays.
- Use concrete and pictorial representations to explain division as equal sharing or partitioning equally into given groups and finding how many are in each group.
- Use concrete and pictorial representations to explain division as repeated subtraction or determining the number of times given equal groups can be obtained in.
- Use concrete and pictorial representation to explain division as inverse of multiplication.

***Fractions***

- Understand a unit fraction by explaining the fraction  $1/f$  as the quantity obtained by taking 1 part when a whole is partitioned into  $f$  equal parts and that a fraction  $1/f$  is the quantity obtained by taking parts of the  $1/f$  size.
- Understand, explain and demonstrate that fractions can be used to represent parts of a group of objects, point on a line, or distances on a number line.
- Compare and order unit fractions and fractions with like denominators by using concrete models, pictorial representations and number line.

***Money***

- Use different denominations of money (1, 2, 5, 10, 20, 50 cedis notes and pesewas coins) to buy and give change.

**ALGEBRA*****Patterns and Relationship***

- Demonstrate an understanding of increasing and decreasing patterns by extending the next two or three terms and identifying errors or missing elements.

**GEOMETRY AND MEASUREMENT**

- Describe 3D objects according to the shape of the faces, the number of edges and vertices. Sort regular and irregular polygons including triangles, quadrilaterals, pentagons, heptagons according to the number of sides.
- Draw and identify angles.
- Use cut-out paper as a square corner to

determine angles which are right angles and angles which are not right angles.

- Use attributes to recognise rhombuses, parallelograms, trapezoids, rectangles, and squares as examples of quadrilaterals and draw examples of quadrilaterals that do not belong to any of these sub categories.
- Represent whole numbers as distances from any given location on a number line.
- Model and describe the relationship between the units metre and centimetre
- Select and justify referents for metre and centimetre.
- Estimate lengths, heights and perimeter of regular and irregular shapes using referents and verify by measuring, using a ruler or tape.
- Model and describe the relationship between the units Kilogram and gram as well as litres and millilitres.
- Estimate masses and volumes using referents and verify by measuring, using a pan balance and weights, calibrated measuring cans.
- Use arbitrary units to measure time taken to complete simple events.
- Read dates on the calendar, order dates of events and count days, weeks, months and years taken by given events.
- Relate the number of seconds to a minute, minutes to an hour, hours to a day and days to a month in a problem-solving context.

### DATA

- Gather and record Data
- Draw and interpret concrete graphs and pictographs to solve problems

## Expectations of a Basic 3 Teacher

If learners are to meet the expectations of the B3 curriculum, teachers will need to:

- 1 Have a mastery of the content standards and the indicators in the B3 curriculum.
- 2 Identify and teach concepts/indicators that are related.
- 3 Employ concrete objects effectively and accurately in all lessons so learners develop strong conceptual understandings of concepts.
- 4 Encourage learners to develop personal strategies to solve problems.
- 5 Use reinforcement activities through the use of Starters and Mental math games to make learning of the concepts easier and enjoying.
- 6 Encourage inquiry and mathematical reasoning by providing pupils with rich tasks or problems to explore and encouraging them to represent their understandings in different ways.
- 7 Encourage learners to communicate their mathematical thinking in the classroom by having students share their thinking or how they got solutions, inviting them to comment on the thinking of others and having learners work in pairs to explore math ideas or solve problems.
- 8 Talk and do less than the learners. Teachers need to listen more and spend most of the time in the classroom having learners explain or do (as opposed to teacher explaining or doing) or having them work with a partner to figure things out.
- 9 Pace learning appropriately, both during class time and in monthly, weekly and term plans by following the proposed term and weekly schemes of learning.
- 10 Create a welcoming learning environment both in and out of the classroom that encourages learners to find mathematics an interesting subject that can be learned easily. Encourage learners that they can be successful math learners regardless of their abilities. Provide opportunities each week for strong students to work with and support struggling learners, and rewards them for doing so.

## SCOPE OF THE SUB-STRANDS

Strands	Sub-strands	Basic 3
Number (Counting, Representation and Cardinality) Operations and Fractions	Numbers: (Counting, Representation and Cardinality)	✓
	Numbers: (Operations)	✓
	Fractions, Representation and Relationship	✓
	Money	✓
Algebra	Patterns and Relationships	✓
Geometry and Measurement	2D and 3D Shapes	✓
	Position and Transformation	✓
	Measurements	✓
Data	Data (Collection, Presentation, Analysis and Interpretation)	✓

Source: NaCCA, Ministry of Education 2019



## SAMPLE YEARLY SCHEME OF LEARNING – BASIC 13

Week	Term 1 (List of term 1 Sub-strands)	Term 2 (List of term 2 Sub-strands)	Term 3 (List of term 3 Sub-strands)
1	Counting, Representation, and Cardinality	Counting, Representation, and Cardinality, Operations (Addition and Subtraction)	Counting, Representation, and Cardinality, Operations (Addition and Subtraction)
2	Counting, Representation, and Cardinality	Counting, Representation, and Cardinality, Operations (Addition and Subtraction)	Counting, Representation, and Cardinality, Operations (Addition and Subtraction)
3	Counting, Representation, and Cardinality, Operations	Patterns, Operations (Addition and Subtraction)	Patterns, Operations (Addition and Subtraction)
4	Counting, Representation, and Cardinality, Operations, Patterns	Patterns, Operations	Patterns, Operations (Addition and Subtraction)
5	Counting, Representation, and Cardinality, Operations, Patterns	Fractions, Representation and Relationship, Patterns, Operations	Money, Patterns, Operations
6	Operations, Patterns	Fractions, Representation and Relationship, Patterns Operations	Money, Patterns, Operations
7	Operations Patterns	Fractions, Representation and Relationship, Patterns, Operations	Fractions, Representation and Relationship, Operations
8	Operations Patterns 2D and 3D Shapes	Patterns, 2D and 3D Shapes, Positions and Transformations	Fractions, Representation and Relationship, Operations
9	Operations, Patterns, 2D and 3D Shapes	Patterns, 2D and 3D Shapes, Positions and Transformations	Patterns, 2D and 3D Shapes, Mass Length and Capacity
10	Operations, 2D and 3D Shapes, Data	Data Operations	Patterns, 2D and 3D Shapes, Mass Length and Capacity
11	Operations, 2D and 3D Shapes, Data	Data, Operations	Data Collection, Operations
12	Operations, Data	Data, 2D and 3D Shapes, Positions and Transformations	Data Collection, 2D and 3D Shapes

Source: NaCCA, Teacher Resource Pack - 2019

## Structure of the Teacher's Guide

The concise Teacher's Guide is organized under the following headings and features.

### Strand

The relevant NaCCA, Ministry of Education 2019 curriculum Strand covered is in the sidebar.

### Sub-Strand

NaCCA, Ministry of Education 2019 curriculum Sub-strand covered.

### Page reference

You will find LB and WB page references on the top right/left for each module.

### Essentials for Learning

This feature indicates the list of knowledge, skills and understanding that learners are expected to possess in order to successfully go through the lesson. It helps to diagnose learners' difficulty and puts the teacher in a better position to teach the day's lesson. This is useful for diagnostic assessment.

### Resources

Helps to aid preparation. The series identifies all the relevant resources necessary to deliver a successful lesson. Resources identified are mostly "NO COST" or "LOW COST" materials that teachers can easily acquire to make their lessons more meaningful and enjoyable.

### Lesson title

Each lesson is clearly stated and given a title. The title is linked to the module.

### Let us Learn

*Recommended teaching time: 20 min.*  
It is the main teaching activity which is broken down into clear steps to support teachers in achieving the lesson indicator(s), and facilitate interaction with the whole class. Suggested statements and questions to ask are provided to support the teacher.

### Differentiated Lessons

With increasing awareness of diversity in our classroom, the series offers teachers the opportunity to address these diversities in the classroom. Conscious effort is made to challenge high ability learners while offering extra support to low ability learners.

**Sub-Strand 2** Number: Operations (Addition, Subtraction, Multiplication and Division)

**Learner's Book page III**  
**Workbook page 78**

**Module 7: Addition Strategies (3)**

**Content Standard**  
B3.1.2.3: Develop and use strategies for mentally computing basic addition and subtraction facts within 100

**Indicator**  
B3.1.2.3.1: Use strategies to mentally add and subtract whole numbers within 100

**Learning Expectation**  
Learners will be able to solve addition problems using a variety of strategies e.g. 'making 10s', decomposition and adding from left to right.

**Essentials for Learning**  
Learners can use 'making doubles' to solve addition problems.

**New Words**  
Decompose, doubles, move part.

**Resources**  
Numeral cards, number line cards.

**Number of Lessons 3**

**Lesson 1: "Making 10s" to solve addition sentences.**

**Starter**  
Play: "Making doubles". Mention a number and learners multiply the number by 2 and call out the number. E.g. 1) 5 → 10    2) 10 → 20  
3) 15 → 30    4) 50 → 100

**Find Out**  
Refer learners to page 11 of Learner's Book. Learners work in pairs. Ask  
Why do you have to add 1 from black to the 9 red?  
Which one is easier: adding 9 and 3 or adding 10 and 1? Learners brainstorm and answer the question.

**Let Us Learn**

- Have learners work in groups of five. Write this sentence on the board:  $18 + 27 = ?$  Elicit from learners how they can make one of the two numbers multiples of 10s.  $18 + 27 = ?$
- Learners discuss which of the two numbers to use. Learners move 2 from 27 and add to 18 to make 20. So,  $18 + 27$  now reads  $20 + 25 = 45$  or learners move 3 from 18 and add it to 27 to make 30. So, the question will read  $15 + 30 = 45$  so,  $18 + 27 = 45$ .
- Have learners practice these in pairs.  
1)  $37 + 43 = ?$     2)  $28 + 47 = ?$  (*critical thinking, collaborative learning, problem solving skills*)
- Refer learners to Learner's Book Let us

**Review Exercise**

**Differentiated lessons**

**Low Ability Learners**  
Add: make multiples of 10s first.  
1)  $19 + 23 = ?$     2)  $37 + 18 = ?$

**High Ability Learners**  
1)  $63 + 37 = ?$     2)  $72 + 35 = ?$

**Assessment for Learning:** Refer learners to Learner's Book page 113 for exercise.

**Suggested Home Work**  
Use making 10s to solve these addition sentences.  
1)  $47 + 29 = ?$     2)  $39 + 35 = ?$   
3)  $29 + 81 = ?$

**Lesson 2: Addition (using decomposition)**

**Starter**  
Play: "Making Doubles". Mention a number and

**48**



## Module

This feature is the description of the lessons to be taught. The Module is a broad presentation of the concept that would be taught in a number of lessons.

## New words

Every lesson in the series identifies key words that learners are expected to know and use appropriately. These are relevant to the lesson.

## Number of Lessons

This specifies the number of lessons that are to be taught under each Module.

## Content Standard

This feature indicates the broad expectations under the strands that learners are expected to achieve in the course of completing that grade level.

## Indicator

This feature indicates the specific things that learners need to know and be able to demonstrate in order to achieve the content standards. Modules (lessons) are generated from these indicators.

## Review Exercise

**Recommended time: 5 min.**  
Offers teachers the opportunity to go over the lesson for learners to make reflective comments about their learning, as well as to discuss misconceptions and common errors, and summarise what they have learnt.

## Suggested Homework

In every Module/lesson, an exploration of the concepts learned in the classroom is further extended to the home. The series suggests relevant home activities that help learners to augment and consolidate what has been learnt in the classroom and its real life application where necessary.

Learner's Book page 195

Workbook page 149

Sub-Strand 2

Number: Operations (Addition, Subtraction, Multiplication and Division)

Module 24: Division (3)

**Content Standard**  
B3.1.2.6: Demonstrate an understanding of division

**Indicator**  
B3.1.2.6.3: Use concrete and pictorial representation to explain division as inverse of multiplication.

**Learning Expectations**  
Learners will be able to relate division as inverse of multiplication.

**Essentials for Learning**  
Learners can do division using equal groupings or repeated subtraction.

**New words**  
Divide, inverse, multiplication, counting multiply.

**Resources**  
Bottle caps, numeral cards.  
Number of lessons 1

Number of Lessons 1

**Lesson 1: Division (using inverse multiplication)**

### Starter

Play: "Counting by 2s. Learners count by 2s up to 20: 2, 4, 6, 8 ....

### Find Out

Refer learners to page 195 of the Learner's Book.  
Ask these questions. How do you solve these?  
Work in pairs.  
Learners brainstorm to find answers to the problem.

### Let Us Learn

- Put learners into groups of five. Write  $12 \div 3 = ?$ . This could be changed into multiplication sentence as  $3 \times ? = 12$ ,  $\rightarrow 4 \times 3 = 12$ ,  $3 \times 4 = 12$  or  $12 \div 3 = 4$
- Refer learners to Learner's Book page 195 to 196. Go through Learn 1 with learners.

### Review Exercise

Let learners work in pairs. Solve these division sentences.

### Differentiated Lessons

#### Low Ability Learners

- $4 \times 3 = 12$
- $7 \times 3 = 21$
- $12 \div 4 =$
- $21 \div 7 =$

### High Ability Learners

Learners work in pairs. Solve these division sentences.  
1)  $32 \div 8 =$   
2)  $45 \div 5 =$   
3) If  $9 \times 8 = 72$  Then  $72 \div 9 =$   
4) If  $12 \times 4 = 48$  then  $48 \div 4 =$

### Assessment for Learning

Refer learners to Learner's Book page 197 to 198 for exercise.

### Suggested Home work

Solve these sentences  
1)  $36 \div 4 = ?$  2)  $25 \div 5 = ?$   
3)  $40 \div 8 = ?$  4)  $30 \div 2 = ?$

For additional exercises on this module, refer to pages 149 - 152 of the Workbook

Encourage learners to do the reflection exercises on pages 199 and 200 after this sub-strand.

Learners complete the self-assessment table on page 201. This will help you know each learner's strength and weaknesses.

Number

79

## Assessment for Learning

The feature specifies questions/activities crafted to assist teachers in checking learners' understanding of the lesson indicator(s). These questions are the "Exercises" in the Learner's Book.

## Learning Expectation

Are provided to help both teachers and learners identify what learners are required to know, understand and do in order to achieve the learning indicator(s).

## Starter

*Recommended teaching time: 5 min.*

Identifies some mental math (games) activities that reinforce concepts learnt. Starters help in preparing learners for new skills, methods or concepts, reinforcing previous steps necessary for this new learning/ lesson.

## Find Out

*Recommended teaching time: 10 min.*

Teases learners knowledge on the 'big idea' of the lesson. This feature is intended to act as a foundation for discussion and investigation and is aimed at getting the learners engaged in the lesson. It helps learners discover by thinking critically.

## Number

### Content Standard

**B3.1.4.1.:** Determine the value of coins and notes in order to solve monetary transactions

### Indicator

**B3.1.4.1.1:** Use different denominations of money (1, 2, 5, 10, 20, 50 cedis notes and pesewas coins) to buy and give change

### Learning Expectation:

Learners can:  
Pay an exact amount

### Essential for Learning:

Learners need to:  
be able to identify the value of the cedi coins and notes. Count in 1s up to 50

### New Words:

cedi, pesewas, note, coin, change

### Resources

Ghana pesewa coins, 1 match box, milk, milo, chocomilo, bottle of water, school bag, exercise books, pen, pencil, etc.

Number of Lessons **2**

### Starter

Call out a number. Pupils make a group with that number of counter. Then tell them to make a set beside the first set that has either more than, less or the same number of objects as the first set. Have them compare and justify their answers.



### Find Out:

Direct learners to page 217 of the Learner's Book.  
Say: look at the items. **Ask:** can you identify and name the items. Can you count and pay the exact amount on the price tag? Can you make different combinations of the cedi notes and coins to pay for the same amount?

### Lesson 1: Paying the exact amount (1)

#### Let us Learn:

- Review previous lesson on the identification of the Ghana cedi notes and coins.
- Also, review lessons on comparing the value of the coins and notes.

- Have a whole class discussion on how much pupils buy items. E.g. pen, pencil, eraser, etc.
- Put learners into small groups of about five. **Collaborative Learning.**
- Display some items in front of each group and task them to discuss and agree on how much they would sell each item.
- Groups should make their own price tags for the items. **Justification of Ideas.**
- Direct learners to Let us Learn on page 217 of the Learner's Book. Lead the class to discuss the items and the prices.

### Review

### Differentiated lesson

#### Low ability learners

- Learners to tell the differences in value among the cedi notes and coins.

#### High ability learners

- Learners to justify the differences in the various price tags

### Assessment for Learning

Refer learners to page 218 to 219 of the learners' book for exercise

## Answers

Answers are provided for all: Exercises in the Learner's Book as well as all Trials in the Workbook.

### ANSWERS

### Workbook

#### Strand 1: Number

**Sub-Strand 1:** Number: Counting, Representation, Cardinality and Ordinality

#### Module 1: Number names

##### Trial 1 Page 2

- 1,000
- 1,200
- 4,540
- 2,806
- 3,115

##### Trial 2

- One thousand four hundred and fifty six
- Three thousand and seventy three
- Two thousand five hundred and seven
- Four thousand four hundred and forty four
- Five thousand

##### Trial 3 Page 3

- 6,075
- 10,000
- 8,541
- 9,266

##### Trial 4

- |   |   |       |
|---|---|-------|
| 1 | b | 8,423 |
| 2 | a | 5,912 |
| 3 | c | 7,530 |
| 4 | c | 6,016 |
| 5 | b | 9,876 |
| 6 | a | 5,906 |

#### Module 2: Counting Sequence (1)

##### Trial 1 Page 5

- 17, 19, 22, 23
- 57, 58, 61, 62
- 97, 94, 93, 90
- 213, 212, 210, 209, 207
- 1,004, 1,006, 1,008, 1,009

#### Module 3: Counting Sequences (2)

**Trial 1** Page 8

- 505, 705
- 1792, 2092
- 5737, 5537
- 679, 479
- 4615, 4815

##### Trial 2 Page 9

- 750, 1250, 1750, 2250, 2750, 3250, 3750
- 623, 1123, 3123
- 67
- 5050
- 8500, 8000, 7500, 7000, 6500, 6000, 5500

##### Trial 3 Page 10

- 9,600, 8,600, 7,600, 6,600, 5,600, 4,600, 3600
- 642, 1,642, 2,642, 3,642, 4,642, 5,642, 6,642
- 590, 1,590, 4590, 5,590
- 8,000, 7,000, 6,000, 5000, 4000
- 3801, 6801, 7801, 8801, 9801

#### Module 4: Estimation quantities

##### Trial 1 Page 11

#### Strand 1

**Sub-Strand 1:** Number: Counting, Representation, Cardinality & Ordinality

#### Module 1: Number names

##### Exercise 1 Page 9

- |     |     |     |     |     |
|-----|-----|-----|-----|-----|
| 1 b | 2 a | 3 c | 4 b | 5 a |
|-----|-----|-----|-----|-----|

##### Exercise 2 Page 10

- |       |       |       |       |       |
|-------|-------|-------|-------|-------|
| 1 → d | 2 → e | 3 → a | 4 → b | 5 → c |
|-------|-------|-------|-------|-------|

#### Module 2: Counting Sequence (1)

##### Exercise 1 Page 14

- 36, 38, 39 and 41
- 98, 97, 95 and 93
- 88, 91, 92 and 94
- 46, 49, 50 and 53
- 102, 101, 98 and 96

##### Exercise 2 Page 15

- 235, 255, 265 and 285
- 733, 713, 703 and 683
- 556, 526, 496 and 486
- 989, 979, 959 and 949
- 750

##### Exercise 3 Page 16

- 856, 806, 706 and 656
- 351, 401, 551 and 601
- 354 and 555
- 8 numbers
- 968, 918, 868, 818, 768 and 718

#### Module 3: Counting Sequences (2)

### Learner's Book

### ANSWERS

#### Exercise 3 Page 21

- 1129, 2129, 3129, 4129, 5129, 6129
- 712, 1712, 2712, 3712, 4712, 5712, 6712
- 456, 1456, 2456, 3456, 4456, 5456, 6456
- 3140, 4140, 5140, 6140, 7140, 8140, 9140
- 200, 1200, 2200, 3200, 4200, 5200, 6200

#### Module 4: Estimation quantities

##### Exercise 1 Page 23

- Estimate – Learner's answer Actual count – 38
- Estimate – Learner's answer Actual count – 99
- Estimate – Learner's answer Actual count – 54
- Estimate – Learner's answer Actual count – 44
- Estimate – Learner's answer Actual count – 64
- Estimate – Learner's answer Actual count – 48

#### Module 5: Representing numbers or quantities with numerals

##### Exercise 1 Page 24

- 683
- 852
- 455
- 974
- 1000

##### Exercise 2 Page 28

- 623
- 841
- 362
- 903
- 1000

#### Module 6: Writing number names

##### Exercise 1 Page 33

## Organisation and structure of the Learner's Book

The user-friendly Learner's Book tackles the new standard-based Mathematics curriculum features and criteria with a clear and logical structure that incorporates the following features.

### Revision Exercises - From basic 2

This precedes the main content and lessons in the Learner's book. Encourage learner's to do them to serve as a recap of what they learnt from KG.

#### REVISION EXERCISES - From Basic 2

Complete the number patterns and describe the rule.

- 1 

37	39	41	43			
----	----	----	----	--	--	--

  
Rule: \_\_\_\_\_
- 2 

52	57	62	67			
----	----	----	----	--	--	--

  
Rule: \_\_\_\_\_
- 3 

49	54	59	64			
----	----	----	----	--	--	--

  
Rule: \_\_\_\_\_
- 4 

33	43	53	63			
----	----	----	----	--	--	--

  
Rule: \_\_\_\_\_
- 5 

27	32	37	42	47		
----	----	----	----	----	--	--

  
Rule: \_\_\_\_\_

6

#### REVISION EXERCISES - From Basic 2

Write how many hundreds, tens and ones are in each number.

- 1 

348		
hundreds	tens	ones
- 2 

574		
hundreds	tens	ones
- 3 

892		
hundreds	tens	ones
- 4 

999		
hundreds	tens	ones

Which digit is in the tens place?

- 5 83
- 6 948
- 7 205

Which digit is in the hundreds place?

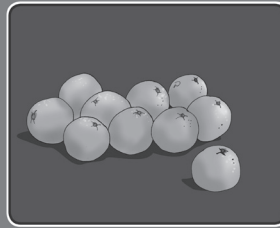
- 8 183
- 9 948
- 10 205

9

### Strand starter

There are four “strands” in the Learner's Book – one for each strand of the Mathematics curriculum. This precedes the beginning of contents under each strand.

#### Strand: 1 Number



#### Strand: 4 Data



### Header and footer labels

**Module:** This is a broad presentation of the concept that would be taught in a number of lessons.

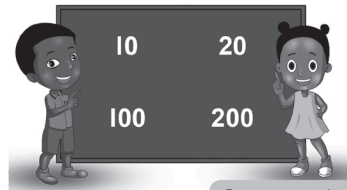
**Sub-strand:** These are larger groups of related mathematics topics to be studied under each strand.

**Strand:** This feature indicates the particular strand from which the lessons are developed.

Sub-Strand 1 NUMBER: COUNTING, REPRESENTATION, CARDINALITY AND ORDINALITY

#### Module 6 Writing number names

Find out



New words

- number word
- number name
- hundred
- thousand

Can you write the number names for these numbers?

Number

29

**New words and a Glossary**

Every module in this series identifies the key words that learners are expected to know and use them appropriately through different lessons.

**New words**

- **zero**
- **numeral**
- **nothing**

**GLOSSARY****N**

nine being one more than eight

ninth coming next after the eighth position and before the tenth position

number give numbers to

nothing not anything; no thing

number bond the relationship between a number and the part that combines to make the number

numeral a symbol used to represent number

**O**

one being a single unit

one less being fewer than the other by one

one more being more than

**P**

pairs a set of two similar things considered as a unit

part a portion of an object

pattern graphical representation of a structure in a particular way

pesewa a Ghanaian currency name

plus sum/add

position the spatial property of a place where or way in which something is situated.

**R**

rectangle a parallelogram with four right angles

remainder something left after other parts have been taken away or the number that remains after subtraction

repeat do over, occur again,

**Find out**

*Recommended time: 10 minutes.*

This begins every module. It teases learners knowledge on the 'big idea' of the lessons. This feature is intended to act as a foundation for discussion and investigation and is aimed at getting the learners engaged in the lesson. It brings out the **critical thinking** abilities of the learners.

**Find out**

Can you write the number names for these numbers?

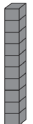
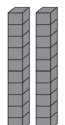
**Let us learn**

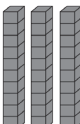
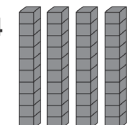
*Recommended time: 20 minutes.*

This is the main teaching activity which is broken down into clear steps to support teachers in achieving the lesson indicator(s), and facilitate interaction with the whole class. Suggested statements and questions to ask are provided to support the teacher.



**Let us learn: I**

We can write number names for multiples of 10 as follows:

Object	Multiples of 10	Number name
1 	10	ten
2 	20	twenty

Object	Multiples of 10	Number name
3 	30	thirty
4 	40	forty

**Let us do an activity**

This feature indicates how practical lessons should be taught. Activities could be pair work (  ) or group work (  ). It is done to promote collaborative learning among learners.

**Let us do an activity****Work in pairs**

Work with a partner?

You will need a stop watch, two containers, sand and a spoon.

Ask your partner to time you. How many spoons of sand can you fetch into the container in 1 minute. Let your partner count.

Do this activity together.

How many spoons could you fetch together in 2 minutes.



Exercise

Recommended time: 10 minutes.  
'Let Us Learn' is followed by **Exercises** where learners practice and consolidate what they have been taught. This provides an opportunity for all learners to strengthen their newly acquired knowledge. Additional exercises are provided in the Workbook.

7

660 minutes

8

240 minutes

9

360 minutes

10

420 minutes

Exercise 2

Work out and write the time equivalents for the following.

1

How many days are in 1 week?

2

How many hours are in 1 day?

3

How many minutes are in 1 hour?

4

How many seconds are in 10 minutes?

Reflection Exercise

Find this feature at the end of every sub-strand.

- helps learners to revise what they have learnt
- offers another opportunity to promote problem-solving and subject understanding.

Reflection Exercise

1

Write the number for these number names.

a

Five thousand and fifteen.

b

Nine thousand eight hundred and seven.

2

Write the number name for these numbers:

a

3,936

b

8,075

3

Skip count to fill in the blank spaces.

a

354

404

604

b

5250

5050

4950

4650

c

5506

6506

7006

Self-assessment

This comes immediately after reflection exercise.  
Why must we assess our learners.  
Usually, it's to improve learning.

When we let learners assess themselves, the results are pride in their learning, a sense of ownership of their efforts, and increased higher-order thinking capacity.

Self-assessment

I can ...	Yes	Not sure	No
find unknown in addition and subtraction sentences.			
use the symbols $\neq$ , $=$ and $>$ to make addition and subtraction sentences true.			
change addition sentences into subtraction sentences and solve them.			
change subtraction sentences into addition sentences and solve them.			
make doubles and 10s to solve addition and subtraction problems.			
use compensation and friendly jumps to solve addition and subtraction sentences.			

1

Strand:

**Number**

## Module 1: Number names

## Content Standard

**B3.1.1.1:** Count and estimate quantities from 0 to 10,000.

## Indicator

**B3.1.1.1.1:** Use number names and the counting sequence to count and estimate quantities up to 10,000.

## Learning Expectation

Learners will be able to read and write the number names up to ten thousand (10,000).

## Essential For Learning

Learners can read and write number names up to one thousand. (1,000)

## New Words

Number name, one hundred, one thousand - ten thousand.

## Resources

Place value chart, number chart.

Number of Lessons **2**

### Lesson 1: Reading and writing number names (1,000 – 5,000)

## Starter

Learners count multiples of 100 up to 1000 and clap simultaneously.

## Find Out

Refer to Learner's Book page 8. Have learners look at the multi-based block and write the number name for each.

- 1) One thousand      2) Five thousand      3) Sixty      4) Four

## Let Us Learn

- Draw the Place Value Chart on the board.

Ten thousand	Thousand	Hundred	Tens	Ones

- Have learners be in groups of five. Write the number 1,246 on the board.
- Learners read and write the numerals under the appropriate columns in the chart:

Ten thousand	Thousand	Hundred	Tens	Ones
	1	2	4	6

Learners read it as: one thousand two hundred and forty-six.

- Write 3,604 on the board. Learners write it in the place value chart.

Ten thousand	Thousand	Hundred	Tens	Ones
	3	6	0	4

Learners write the number name for it i.e. Three thousand six hundred and four. (**critical thinking, collaborative learning**).

- Give out the place value chart to learners. They write numbers on their own and write it under the appropriate column in the place value chart. (**critical thinking, collaborative learning**)
- Refer to **Let us learn: 1** on page 8 of the Learner's Book. Go through the exercises with learners.

## Review Exercise.

## Differentiated Lessons

## Low Ability Learners

- Write the number name for these numbers.  
1) 645      2) 1,332

## High Ability Learners

- Write the number names for these numbers.  
1) 4,999      2) 4,005      3) 3,079

## Assessment For Learners

Refer learners to Learner's Book pages 9 and 10 for exercise.

## Suggested Home Work

Write the number names for these numbers.  
1) 3,685      2) 4,789      3) 369      4) 4,906



## Lesson 2: Reading and writing number names (5,000 – 10,000)

### Starter

Learners count multiples of 100 up to 1000 and clap simultaneously.

Ten thousand	Thousand	Hundred	Tens	Ones
	5	8	9	6
	6	0	3	5
1	0	0	0	0

### Let Us Learn

- In groups of five, give out the Place Value Chart.
- Write these numbers on the board for learners to write them in the chart.  
1) 5,896      2) 6,035      3) 10,000

Five thousand eight hundred and ninety-six.

Six thousand and thirty-five.

Ten thousand

- Repeat this exercise. Learners write their own numbers and write number names for them. They should move round other groups and compare their work. (**critical thinking, collaborative learning**)
- Refer learners to **Let us learn: 2** on page 9 of the Learner's Book. Go through the 2 questions with learners.

### Review Exercise

### Differentiated Lessons

#### Low Ability Learners

- Learners work in pairs. Write number names for these numbers.  
1) 5,648      2) 6,099

### High Ability Learners

- Write number names for these numerals.  
1) 9,804      2) 10,024      3) 9,999

### Assessment For Learners

Refer learners to Learner's Book page 10 for exercise.

### Suggested Home Work

Write number names for these numbers.

- 1) 8,764      2) 9,065      3) 648      4) 4,404

For additional exercises on this module, refer to pages 2 - 4 of the Workbook.

**Module 2:** Counting sequence (1)**Content Standard**

**B3.1.1.1:** Count and estimate quantities from 0 to 10,000.

**Indicator**

**B3.1.1.1.1:** Use number names and the counting sequence to count and estimate quantities up to 10,000.

**Learning Expectation**

Learners will be able to count forwards by 10s.

**Essentials For Learning**

Learners can count forwards by 10s up to 1000.

**New words**

Count, forwards, backwards, skip count.

**Resources**

100 and 1000 numeral charts, numeral card 10 -100.

Number of Lessons **4****Lesson 1:** Counting forwards by 10s  
up to 1000**Starter**

Play: "How Many fingers up" and "How Many" fingers down? Hold up fingers on two hands. Say: How many fingers up and how many fingers down? Learners call out the number of fingers they see up and the number of fingers they see down.

**Find Out**

Have learners work in pairs. Refer learners to page 11 of the Learner's Book. Learners count the number of fingers there. Elicit from them how they got the answer. E.g. some may count by 10s whilst others may count in 5s. (*critical thinking, collaborative learning, justification of ideas*).

**Let Us Learn**

- Revise counting forwards and backwards by 1s with the class. Refer to **Let us Learn: 1** on page 11 of the Learner's Book.
- Put learners into groups of six. Give them 100 number charts. Learners count by 10s in columns starting on these numbers: 2,3,4,5,6,7,8,9,10.
- The group leaders should identify errors or omissions and correct them. (*critical thinking, collaborative learning, leadership skills*)
- Give 1000 numeral cards to learners in their groups. They play counting forwards by 10s starting on 200, 800, 900, etc.

- Deduce from learner's a pattern or trend that they have identified when they were counting forwards by 10s.

**The digit in the tens column increases by 1 when counting forwards by 10.**

- Refer learners to Learner's Book page 11. **Let us Learn: 2 (1)**. Go through the exercise with learners.
- Have learners start on 22 and skip count forwards in 10s as 22, 32, 42, 52, ...

**Review Exercise****Differentiated Lessons****Low Ability Learners**

- Have learners work in pairs. Give them 100 numeral charts. They skip count forwards by 10s starting from any number.

**High Ability Learners**

- Give them 1000 numeral cards. They skip count forwards by 10s starting from any number.

**Assessment For Learners**

Refer learners to Exercise 1 on pages 14 and 15 of the Learner's Book.

**Suggested Home Work**

- Write multiples of 10s from 80 – 200.
- Write multiples of 10s from 400 – 600.

## Lesson 2: Counting backwards by 10s up to 1000

### Starter

Count forwards and backwards by 10s up to 100.

### Let Us Learn

- Call out 10 learners to the front of the class. Make sure you cater for gender and social inclusiveness. Give each of them multiples of 10 numeral cards, arranged from 100 – 10. Each learner reads his/her number.  

100	90	80	70	60
50	40	30	20	10

*(personal development, attention to precision, collaborative learning)*
- Give out the 100 numeral chart to learners in their groups. They skip count backwards by 10s starting from different numbers. Give them the 1000 numeral cards to repeat the activity above. *(collaborative learning, personal development, attention to precision)*
- Refer learners to **Let us Learn: 2 (Question 2)** on page 13 of the Learner's Book. They skip count backwards from 137 up to 57. Elicit from learners what they have identified as they count backwards by 10s. *(critical thinking, collaborative learning, justification of ideas)*

**The digit in the tens place decreases by 1 when counting backwards by 10.**

### Review Exercise.

### Differentiated Lessons

#### Low Ability Learners

- Give out 100 numeral charts to learners. They skip count backwards by 10s from any number. Let them work in pairs.

#### High Ability Learners

- Give out 1000 numeral charts to learners. They skip count backwards from these numbers.  
 1) 520                      2) 802                      3) 905

### Assessment For Learners

Refer learners to Exercise 2 on pages 15 of the Learner's Book.

### Suggested Home Work

- Write multiples of 10 from 92 up to 12.
- Write multiple of 10 from 300 up to 150.

## Lesson 3: Counting forwards by 50s up to 1000

### Starter

Play: "Counting by 10s". Learners count forwards by 10s starting from 10 up to 100.

### Let Us Learn

- Put learners into groups of five. (Make sure you reshuffle the members in the groups).
- Give them the 1000 numeral cards. Have learners skip count by 50s starting from 50 and 151 up to 1000.
- The selected leaders should make sure every learner participates actively.
- Draw a number line on the floor. Calibrate it by 50s. Have learners jump over it and count by 50s simultaneously.
- Refer learners to **Let us learn: 3 (Question 1)** on page 13 of the Learner's Book. Go through the exercise with them.

### Review Exercise

### Differentiated Lessons

#### Low Ability Learners

- Give out 500 number charts to learners, they skip count by 50's from any number up to 500.

#### High Ability Learners

- Give out 1000 number charts to learners. Learners skip count by 50s from any number up to 1000.

### Assessment For Learners

Refer learners to Exercise 3, questions 2 and 3 on page 16 of the Learner's Book.

### Suggested Home Work

- Write the multiples of 50 from 112 up to 500.
- Write the multiples of 50 from 510 up to 1000.

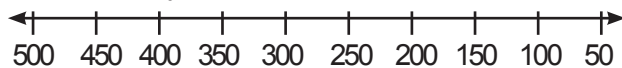
**Lesson 4:** Skip count backwards by  
50s up to 1000**Starter**

Play: "Making Doubles" Call out a number between 1 and 10. Learners call out the double of that number.

E.g. 5 → 10    2) 3 → 6    3) 4 → 8    4) 10 → 20

**Let Us Learn**

- Draw a number line on the floor. Calibrate it with intervals of 50s. Learners jump over it and say the numbers.



*(collaborative learning, personal development, attention to precision)*

- Give out the 500 number charts to learners in their groups. They skip count backwards by 50s from 420 up to 120. Let them repeat the same activity with the 1000 number charts. They should start from any number.
- Refer learners to **Let us learn: 3 (Question 2)** on page 14 of the Learner's Book. Go through the exercise with them.

**Review Exercise****Differentiated Lessons****Low Ability Learners**

- Give out the 500 number charts to them. They skip count backwards by 50s starting from any number.

**High Ability Learners**

- Give out the 1000 number charts to learners. They skip count backwards by 50s starting from these numbers  
1) 700                      2) 920                      3) 821

**Assessment For Learners**

Refer learners to Exercise 3, questions 1, 4 and 5 on page 16 of the Learner's Book.

**Suggested Home Work**

- Write multiples of 50's starting from 400 up to 200.
- Write multiples of 50 starting from 600 up to 200.

For additional exercises on this module on this module, refer to pages 5 - 7 of the Workbook.

## Module 3: Counting sequences (2)

## Content Standard

**B3.1.1.1:** Count and estimate quantities from 0 to 10,000.

## Indicator

**B3.1.1.1.1:** Use number names and the counting sequence to count and estimate quantities up to 10,000.

## Learning Expectations

Learners will be able to skip count forwards and backwards by 100s, 500s and 1000s starting at any number.

## Essentials For Learning

Learners can count forwards and backwards by 10s and 50's starting at any number.

## New Words

Increase, decrease, forwards, backwards.

## Resources

1000 number chart, number cards with multiples of 100 up to 1000.

Number of Lessons **6**

## Lesson 1: Counting forwards by 100s up to 5,000

**Starter:** Play "10 more than". Mention a number and learners add 10 to the number.

E.g. 1) 10 → 20      2) 20 → 30  
3) 60 → 70      4) 110 → 120

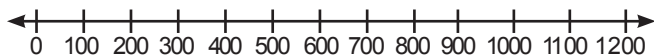
## Find Out

Refer learners to page 17 of the Learner's Book. Have learners answer these questions.

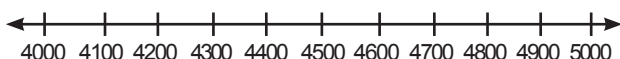
- 1) What is Musa doing?
- 2) In what sequence is he counting?
- 3) Can you give the next 3 numbers?
- 4) What are they? (*critical thinking, problem solving skills, personal development*)

## Let Us Learn

- Draw a number line on the board. Calibrate it in 100s.



- Call out some learners to skip count by 100s using a pointer. They can start on any number.
- Give out number line cards to learners in their groups. They skip count by 100s.



- Learners listen carefully and identify and correct errors or omissions. (*critical thinking, collaborative learning, attention to precision, problem solving skills*)

- Refer learners to **Let us learn: 1** on page 17 of the Learner's Book. Have learners use their 1000 number chart. They skip count forwards by 100s starting on 334 up to 3000. They should work in groups of four. Ask learners to tell you what they have identified as they skip count forwards by 100s.
- Counting forwards by 100s, we add 100 to get the next number. (*critical thinking, collaborative learning, problem solving skills, attention to precision*)

## Review Exercise

## Differentiated Lessons

## Low Ability Learners

- Give out 1000 number charts to learners. They skip count by 100s starting from any number.

## High Ability Learners

- Working in pairs, learners write and count multiples of 100 from 3,100 up to 4,200.

## Assessment for Learning

Refer learners to Exercise 1, questions 1, 3 and 4 on page 19 of the Learner's Book.

## Suggested Home Work

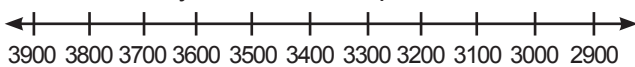
Write multiples of 100 from 800 up to 2,200.  
Write multiples of 100 from 6,700 up to 9,100.

**Lesson 2: Counting backwards by 100s up to 5,000****Starter**

Play “10 more”. Mention a number and learners add 10 to the number and call out the number. E.g. 90→100, 60→70

**Let Us Learn**

- Put learners into convenient groups. Give out the number line cards to learners in their groups. They skip count backwards by 100s starting from any number. Make sure every learner takes part.



- Give out 1000 number chart to learners in their groups. They skip count backwards by 100s from any number.
- Refer learners to **Let us learn: 1** on page 17 of the Learner's Book. Have learners use their 1000 number chart. They skip count backwards by 100s starting on 660 down to 60. They should work in groups of five.

**Review Exercise****Differentiated Lessons****Low Ability Learners**

- Count backwards by 100s starting from 3,000 to 1,800. Work in pairs.

**High Ability Learners**

- Learners work in pairs; they count backwards by 100's starting from 5,000 up to 3,200.

**Assessment For Learners**

Refer learners to Exercise 1, questions 2 and 4 on page 19 of the Learner's Book.

**Suggested Home Work**

Write multiples of 100 from 1,600 – 2000.  
Write multiples of 100 from 5,140 – 1,100.

**Lesson 3: Counting forwards by 500s up to 10,000****Starter**

Play “100 more”. Mention a number and let learners add 100 to the number and call out the number. E.g.

1) 200→300 2) 650→750

**Find Out**

Refer learners to Learner's Book page 17.

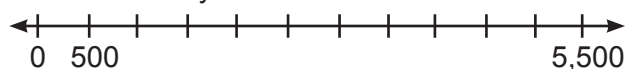
Learners should look at Ebo and answer these questions.

What multiples is Abiba counting in?

- What would be the next 3 numbers for Abiba?
- Learners work in pairs and brainstorm and come out with the answers. (*critical thinking, collaborative learning, problem solving skills*)

**Let Us Learn**

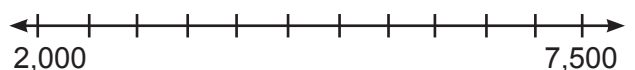
- Draw a number line on the board and calibrate it in 500s. Have learners count forwards by 500s.



- Give out number line cards which has been calibrated in 500s. Learners in pairs count forwards by 500s starting from any number. Learners identify their own errors and omissions and correct themselves. (*critical thinking, collaborative learning, problem solving skills*)
- Refer learners to **Let us learn: 2** on page 18 of the Learner's Book. Have learners use their 1000 number chart. They skip count forwards by 500s starting on 500 up to 7000. They should work in groups of five.

**Review Exercise****Differentiated Lessons****Low Ability Learners**

- Give number line cards to learners to count forwards by 500s starting from any number.





**High Ability Learners**

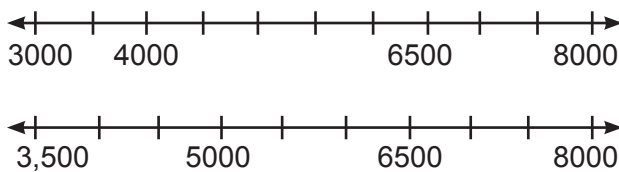
- Learners work in groups of four. They draw number lines, calibrate them by 500s starting from 300 – 6,000 and count in turns. (*collaborative learning, critical thinking, problem solving skills*)

**Assessment For Learners**

Refer learners to Exercise 2, questions 1, 2 and 4 on page 20 of the Learner's Book.

**Suggested Home Work**

Fill in the gaps.

**High Ability Learners**

- Learners form a big circle. They skip count backwards by 500s starting from 9,500. (*critical thinking, collaborative learning, attention to precision*)

**Assessment For Learners**

Refer learners to Exercise 2, questions 3, 5 and 6 on page 20 of the Learner's Book.

**Suggested Home Work**

Fill in the missing numerals

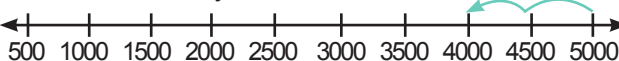
1)  6,000  5,000   3,500

**Lesson 4: Counting backwards by 500s up to 10,000**

**Starter:** Play “10 less”. Mention a number and learners subtracts 10 and calls out the number.

**Let Us Learn**

- Draw a number line on the board and calibrate it by 500s.



- Learners use a pointer to skip count backwards by 500s from 5000 down to 500.
- Give out number line cards to learners in groups of six. They skip count backwards by 500s starting on any number. (*critical thinking, collaborative learning, attention to precision*)
- Refer to **Let us learn: 2** on page 18 of the Learner's Book. Have learners count backwards by 500s starting from 2,734 to 234.

**Review Exercise****Differentiated Lessons****Low Ability Learners**

- Learners form a big circle; they skip count backwards by 500s starting from 5,000. They correct errors and omissions themselves as they count.

**Lesson 5: Counting forwards by 1000s to 10,000****Starter**

Play “counting by 10s” up to 100. Learners count 10, 20, 40, 50 ... 100 and clap simultaneously.

**Find Out**

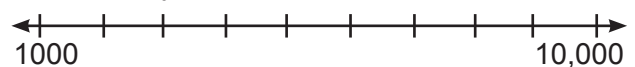
Refer learners to learners' book page 17.

Learners look at Ebo and tell what he is doing. Have learners work in pairs and answer these questions.

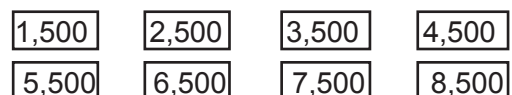
- Is Ebo counting forwards or backwards?
- What sequence is he counting in?
- Say the next 3 numbers that Ebo has to count? (*critical thinking, collaborative learning, problem solving skills*)

**Let Us Learn**

- Put learners into groups of four.
- Give each group a number line card which has been calibrated in 1000s. Have learners count forward by 1000's starting from any number.



- Give out number line cards to learners. They count from any number up to 10,000.





- Refer learners to **Let us learn: 3** on page 18 of the Learner's Book. Learners count forwards by 1000s 1,234 up to 10,000.

### Review Exercise

#### Differentiated Lessons

##### Low Ability Learners

- Give out number line cards for learners to count forwards by 1,000s from any number to 10,000.

##### High Ability Learners

- Learners write multiples of 1,000 from 6,800 up to 10,000.

#### Assessment For Learners

Do the assessment after lesson 6.

#### Suggested Home Work

Write multiples of 1,000 from 2,200 up to 10,000.

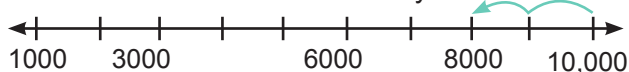
## Lesson 6: Counting backwards by 1,000s up to 10,000

#### Starter

Play "Counting backwards by 10s up to 100 whiles clapping simultaneously.

#### Let Us Learn

- Draw a number line on the board. Have learners count backwards by 1000s.



**(Attention to precision, leadership skills)**

- Learners work in pairs, they count by 1,000s starting from these numbers.  
2,200      3,200      4,200  
9,200 .... Up to 10,000.

- In pairs, one learner starts counting by 1000's from any number whilst the partner listens attentively and correct errors and omissions. They rotate. (**collaborative learning, critical thinking, personal development, leadership skill**)
- Refer learners to **Let us learn: 3** on page 18 of the Learner's Book. Learners count backwards by 1,000's. They start at 9,450 and count back to 1,450.

### Review Exercise

#### Differentiated Lessons

##### Low Ability Learners

- Learners work in groups of six. They make a circle and count from 1000 up to 5000. Learners correct errors and omissions as they skip count the sequence.

##### High Ability Learners

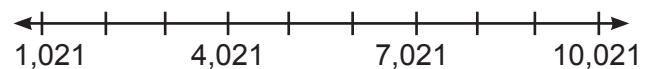
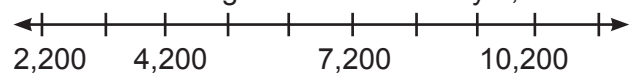
- Work in groups of six. They make a circle and skip count by 1000s starting from 5,200 up to 10,000. Errors and omissions should be corrected by themselves.

#### Assessment for Learners

Refer learners to Learner's Book page 21 for exercise.

#### Suggested Home Work

Fill in the missing numerals count by 1,000s.



For additional exercises on this module, refer to pages 8 - 9 of the Workbook.

## Module 4: Estimating Quantities

**Content Standard**

**B3.1.1.1:** Count and estimate quantities from 0 to 10,000.

**Indicator**

**B3.1.1.1.1:** Use number names and the counting sequence to count and estimate quantities up to 10,000.

**Learning Expectations**

Learners will be able to give an estimate of a number of objects in groups.

**Essentials For Learning**

Learners can count to find out how many.

**New words**

Range, actual, guess, estimate, over estimation, under estimation

**Resources**

Bottle caps, pebbles, bowls/cups, seeds.

Number of Lessons **1****Lesson 1:** Estimating number of objects in groups.**Starter**

Play: "Adding 10s". Mention a number and learners add 10 to it and call out the number.  
e.g. 1) 10→20    2) 13 → 23    3) 88→98

**Find Out**

Refer learners to page 22 of the Learner's Book. Have learners work in groups of five. Every learner in the group estimate the number of dice on the page. They later count to get the actual number.

**Let Us Learn**

- Put a handful of pebbles in your hand (e.g.12). have learners guess the number. Count with them, the one who gets the actual number wins.
- In groups of five, give each group a cup, a bowl and some pebbles.
- Play the game "How many". One learner turns his back towards the group. He/she put some pebbles inside a cup, turns back and ask learners to estimate the number of objects in the cup. They later count to find out the actual number and the one close or who gets the actual number wins. Learners repeat this activity with different leaders with different number of objects. **(Critical Thinking, Collaborative Learning)**
- Refer learners to **Let us learn** on page 22 of the Learner's Book. Learners estimate the number of oranges on the tree.

- They count to know the group who made a good estimate.
- In their groups, learners estimate the number of oranges in the bowl.
- They find out the groups which made a good estimate.

**Review Exercise**

Work in groups of five. One uses the two hands to pick pebbles. Each learner in the group estimate and call out the number. They count to find out who got it right or who made a good estimate. They rotate the leaders until each person acts as a leader. **(Critical Thinking, Collaborative Learning, Attention to Precision, Leadership Skills)**

**Assessment For Learners**

Refer learners to Learner's Book pages 23 - 25 for exercise.

**Suggested Home Work**

Learners fill their cups with pebbles at home. They estimate, count and record and present to class the next day.

Estimate \_\_\_\_\_

Actual \_\_\_\_\_

Learners compare their work with their partners in their groups.

For additional exercises on this module, refer to pages 11 - 13 of the Workbook.

**Module 5:** Representing numbers or quantities with numerals**Content Standard**

**B3.1.1.1:** Count and estimate quantities from 0 to 10,000.

**Indicator**

**B3.1.1.1.1:** Use number names and the counting sequence to count and estimate quantities up to 10,000.

**Learning Expectation**

Learners will be able to: represent numbers or quantities with written numerals up to 1000.

**Essentials For Learning**

Learners can count forwards and backwards by 1000 up to 10,000. They can write numerals up to 10,000.

**New Words**

N numeral, quantities, number, hundreds, thousand, abacus

**Resources**

Abacus, multi-based block, bottle caps.

Number of Lessons

1

**Lesson 1:** Representing quantities with numerals**Starter**

Play: "Counting Forwards and Backwards in 10s up to 100".

**Find Out**

Refer learners to find out page 26 of the Learner's Book. Learners work in pairs, and identify the number of straws in each group.

**Let Us Learn**

- Put learners into groups of five. They select a leader. The leader calls out a number and each member of the group write the numeral for it. They compare their answers with the number of members in the group. E.g. 1) Fifteen → 15 2) Thirty-nine → 39
- Pick some multi-based block. Show it to the class and let them read and write the numeral for it. E.g. 1 flat, 3 longs and 2 cubes is 132.
- Repeat this activity with different multi-based block. (**Critical thinking, Collaborative Learning, Attention to Precision**)
- Refer learners to **Let us learn** on page 26 of the Learner's Book. Learners read the number on the abacus and write the numeral for it.

- Go through question 2 with learners. 2 flats, 3 longs and 4 cubes is 234. (**Critical Thinking, Collaborative Learning, Attention to Precision**)

**Review Exercise****Differentiated Lessons****Low Ability Learners**

- Write numerals for these quantities.
  - 6 longs and 4 cubes =
  - 1 flat 3 longs and 2 cubes =
- Let learners work in pairs.

**High Ability Learners**

- Mould these number names on abacus and write numerals for them.
- Four hundred and ninety-eight.
- Nine hundred and eighty-six.

**Assessment For Learning :**

Refer learners to Learner's Book page 27 and 28 for exercise.

**Suggested Home Work**

Show these numbers on the abacus

1) 68, 2) 129 3) 647 4) 999

For additional exercises on this module, refer to pages 15 - 18 of the Workbook

## Module 6: Writing number names

## Content Standard

**B3.1.1.1:** Count and estimate quantities from 0 to 10,000.

## Indicator

**B3.1.1.1.1:** Use number names and the counting sequence to count and estimate quantities up to 10,000.

## Learning Expectation

Learners will be able to write number names/words for given multiples of 10s and 100s up to 9999.

## Essentials For Learning

Learners can write numerals for quantities up to 10,000.

## New Words

Number name/word, hundred, thousand.

## Resources

Multi-based block of tens, number words cards.

Number of Lessons **2**

## Lesson 1: Writing number names for multiples of 10.

## Starter

Play: "10 more" call out a number and learners add 10 to it and call out the number.

E.g. 1) 10 → 20      2) 16 → 26  
3) 35 → 45      4) 60 → 70

## Find Out

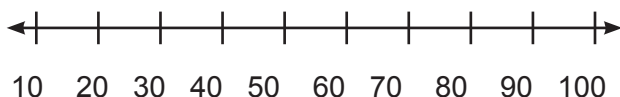
Refer learners to Learner's Book page 29.

Have learners work in pairs. Elicit from them how to write the number words/names.

They compare their work and correct wrong spellings. (*Critical Thinking, Collaborative Learning, Personal Development, Attention to Precision*)

## Let us Learn

- Learners work in groups of four. Draw a number line on the board. Label it with multiples of 10.



- Give out number name cards to learners in their groups. They read the numbers on the number line and pick a number name card to match it.
- Learners select a leader in their groups. He/she mentions a number and the rest

look through the cards they have and pick the correct one. (*Critical Thinking, Collaborative Learning, Attention to Precision*)

- Refer learners to **Let us learn: 1** on page 29 of the Learner's Book. Learners count the objects, read the numeral and write the number names. Learners continue until they reach 100.

## Review Exercise

## Differentiated Lessons

## Low Ability Learners

- Learners work in pairs. Write the number names for these numerals.  
1) 80      2) 120

## High Ability Learners

- Work in pairs. Write the number names for these numerals. 1) 80      2) 240      3) 600

## Assessment For Learning

Refer learners to Learner's Book page 33 for exercise.

## Suggested Home Work

Write number names for these numerals.

- 1) 60      2) 120      3) 450      4) 810

**Lesson 2:** Writing number names  
for multiples of 100**Starter**

Play: "10 more". Call out a number and learners add up to 10 and call out the number.

E.g. 1) 10 → 20      2) 16 → 26  
3) 35 → 45      4) 60 → 70

**Let Us Learn**

- Put learners into groups of five. Give numeral cards in multiples of 100s to them. Call out a number, say 200 and learners look for numeral card two hundred and show it up. In their groups, learners repeat this activity several times.
- Pick different flats, show them to the class and learners call out the number name (***Critical Thinking, Collaborative Learning, Attention to Precision***).
- Refer learners to Learner's Book page 31. Go through **Let us Learn: 2** with learners. They count the number of flats read the numerals and write the number names for them.

**Review Exercise****Differentiated Lessons****Low Ability Learners**

- Write the number names for these numerals.  
1) 200                      2) 400

**High Ability Learners**

- Write the number names for these numerals.  
1) 800                      2) 1200                      3) 3000

**Assessment For Learning**

Refer learners to Learner's Book page 34 for exercise.

**Suggested Home Work**

Write number names for these numerals.

1) 500      2) 900      3) 1,800      4) 9,000

For additional exercises on this module, refer to pages 19 - 20 of the Workbook

**Module 7:** Describing the position of numbers**Content Standard**

**B3.1.1.1** Count and estimate quantities from 0 to 10,000.

**Indicator**

**B3.1.1.1.2** Identify numbers in different positions around a given number in a number chart

**Learning Expectations**

Learners will be able to: identify numbers in different positions around a given number.

**Essentials For Learning**

Learners can identify numbers which come before and after a given number.

**New Words**

Above, right, left, below, top, beside, between, identify.

**Resources**

Number chart, number line cards.

Number of Lessons **1**

**Lesson 1:** Describing position of numbers.**Starter**

Play: "100 more". Mention a number and learners say a number which is 100 more than the number mentioned. E.g. 1) 220→320  
2) 400→500 3) 900→1000

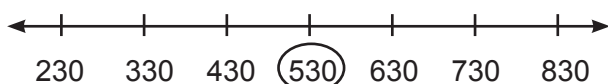
**Find Out**

Refer learners to page 35 of the Learner's Book. Have learners look at the chart. Read the puzzle in pairs and identify the number which lies between 73 and 521. That number is 15. Have learners justify their answer.

**(Problem Solving Skills, Critical Thinking, Collaborative Learning)**

**Let Us Learn**

- Put learners into groups of five. Circle different numbers on a number line for each group. Learners describe the circled number in relation to other numbers to the left and right of the circled number.



- Learners identify the circled number as **530**.
- They identify the number to the right and left of it. To the left the numbers are 430, 330 and 230. To the right the numbers are 630, 730 and 830.

- Give out number chart to learners in their groups. Circle any number. Write these questions on the board for learners to answer.
  - \* What number is above me?
  - \* What number is below me?
  - \* Write the numbers to the left of me.
  - \* Write the number which is on my right.
- Refer learners to **Let us learn, Example 1** on pages 35 to 36 of the Learner's Book. Learners identify "5,010" and answer the questions that follows.
- Refer learners to **Let us learn, Example 2** on page 36 of the Learner's Book. Learners identify "8,586" and answer the questions that follow.

**Review Exercise****Differentiated Lessons****Low Ability Learners**

- Give out a 100-number chart to learners. Circle 60. They write 2 numbers to the right and left of it.

**High Ability Learners**

- Refer learners to **Let us learn** on page 35 of the Learner's Book. Circle **3529**.
- Learners write one number above it, 2 numbers to the right and 2 numbers below it.

**Assessment For Learning**

Refer learners to Learner's Book page 37 for exercise.

**Suggested Home Work**

"I am 114".

124	138	118	120
150	121	181	166
192	165	114	137
149	172	186	199
112	155	115	160

Write 2 numbers above me.

Write 2 numbers at my right side.

Which 2 numbers are below me? Write them.

For additional exercises on this module, refer  
to pages 21 - 22 of the Workbook



**Module 8:** Relationship between numbers up to 5000**Content Standard**

**B3.1.1.1:** Count and estimate quantities from 0 to 10,000.

**Indicator**

**B3.1.1.1.3:** Describe numbers and the relationship between numbers from 0 to 10,000 in equivalent ways using the place value concept.

**Learning Expectations**

Learners will be able to: describe numbers and the relationship between numbers up to 5,000 in equivalent ways.

**Essentials For Learning**

Learners can identify numbers in different positions around a given number.

**New Words**

Values, digit, tens, ones, hundreds, thousands.

**Resources**

Place value chart, numeral cards with 3-digit numbers.

Number of Lessons **2****Lesson 1:** Finding the relationship between numbers (using multi-base block)**Starter**

Play; "100 more". Mention a number and learners call out numbers which are 100 more than that number. E.g. 200 → 300, 150 → 250.

**Find Out**

Refer learners to page 38 of the Learner's Book. Have learners work in pairs. They compare the two numbers and draw their own conclusion.

**Let Us Learn**

- Write 687 on the board. learners expand or decompose it as  $600 + 80 + 7$ . Have learners work in pairs. They write their own 3-digit numbers and decompose them. **(Critical Thinking, Problem Solving Skills, Collaborative Learning)**
- Have learners work in groups of six. Give out the multi-based block to each group to identify the values of the blocks, the flats, the rod and the unit.
- Call out a number and learners in their groups pick the multi-based block to represent it. E.g. 523. Learners pick 5 flats, 2 longs and 3 units to represent it. The group that shows theirs first is commended. Repeat this game with different numbers up to one thousand. **(critical thinking, problem solving skills, collaborative learning)**

- Refer learners to **Let us learn: 1** on page 38 of the Learner's Book. Explain the values of each digit in the number 242 to learners.  
 $2 \rightarrow 2$  hundred     $4 \rightarrow 4$  tens  
 $2 \rightarrow 2$  ones  
 Use the hundred- frame in **Example 1** on page 39 to explain as well.
- Also, go through **Example 2** on pages 40 and 41 with Learners.

**Review Exercise****Differentiated Lessons****Low Ability Learners**

- Have learners work in pairs. They use the multi-base blocks to model these numbers.  
 1) 632                      2) 326                      3) 308

**High Ability Learners**

- Model these    1) 432                                      2) 2,641  
 Let them use the multi-base blocks.

**Assessment for Learning**

Refer learners to Exercise 1 on pages 42 and 43 of the Learner's Book.

**Suggested Home Work**

Have learners work in pairs. Model these numbers  
 1) 2436                      2) 444                      3) 6,228  
 4) 4442

## Lesson 2: Finding the relationship between numbers (using abacus)

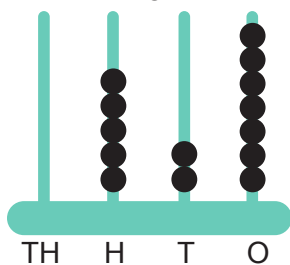
### Starter

Play: "10 less". Call out a number and learners subtract 10 from it and call out the number.

E.g. 1)  $15 \rightarrow 5$  2)  $28 \rightarrow 18$   
3)  $110 \rightarrow 100$

### Let Us Learn

- Put learners into sizeable groups. Have learners model these numbers using the multi-base block. 1) 268 2) 2,654 3) 1,990 (**Critical Thinking, Problem Solving Skills, Collaborative Learning**)
- Give out the abacus and the pierced bottles caps to learners. Have learners discuss in their groups and decide the colours of the bottle caps they will use to represent the thousands, hundreds, tens and the ones.
- Write 527 on the board. Learners model the number using the abacus.



- Repeat this activity with different numbers.
- Refer learners to **Let us learn: 2** on page 41 of the Learner's Book.  
In 548, the 5 means 5 hundred (500), the 4 means 4 tens (40) the 8 means 8 ones (8).

### Review Exercise

### Differentiated Lessons

#### Low Ability Learners

- Give out abacus and bottle caps to learners in pairs. They model these numbers:  
1) 682 2) 463.  
Learners write the value for each digit.

### High Ability Learners

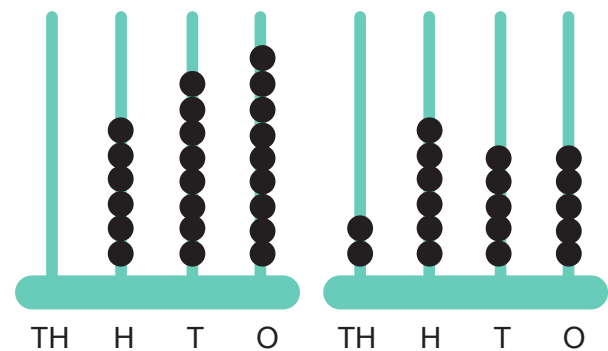
- Working in pairs, learners model these numbers using the abacus:  
1) 1,608 2) 5,864  
Learners write the values for each digit.

### Assessment for Learners

- Refer learners to Exercise 2 on pages 43 to 44 of the Learner's Book.

### Suggested Home Work

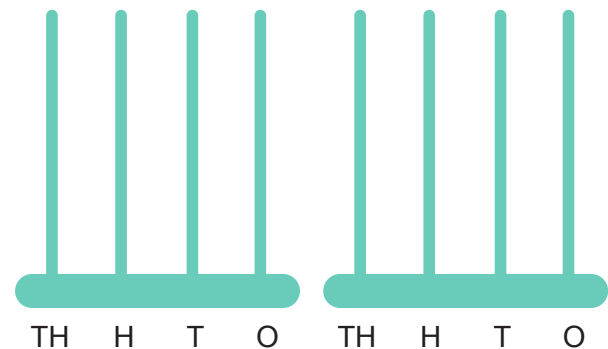
Write the numbers shown on these abaci.



1)  2)

Show these numbers on abacus.

1) 668 2) 5,069



For additional exercises on this module, refer to pages 23 - 27 of the Workbook

**Module 9:** Relationship between numbers up to 10,000**Content Standard**

**B3.1.1.1:** Count and estimate quantities from 0 to 10,000.

**Indicator**

**B3.1.1.1.3:** Describe numbers and the relationship between numbers from 0 to 10,000 in equivalent ways using the place value concept.

**Learning Expectations**

Learners will be able to: describe numbers and the relationship between numbers up to 10,000 in equivalent ways.

**Essentials For Learning**

Learners can describe the position of a given number in a chart in different ways.

**New Words**

Multi-base block, rod, unit, thousands, hundreds, tens.

**Resources**

Multi-base blocks, number line cards.

Number of Lessons **2**

## Lesson 1 Describing numbers (1 – 5000) using multi-base block.

**Starter**

Play '100 more'. Call out a number and learners call out another number which is 100 more.

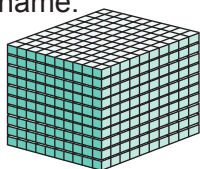
E.g. 200→300    2) 121→221    3) 705→805

**Find Out**

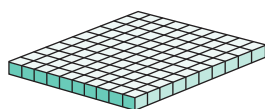
Have learners work in pairs. Refer learners to **Find out** on page 45 of the Learner's Book. They read and write the number shown with the multi-base block.

**Let us Learn**

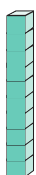
- Put learners into groups of five. Give out at least 6 each of the multi-based block to learners in their groups. Pick them one by one and learners call out its value and name.



e.g. 1. The name is block.  
Its value is 1000



2. The name is flat.  
Its value is 100



3. The name is long/rod.  
Its value is 10



4. The name is cube  
/unit. Its value is 1

- Now write some numbers on the board and learners use the multi-based block to model them. 1) 285    2) 5,890  
3) 4,010  
*(Critical Thinking, Collaborative Learning, Leadership Skills, Attention to Precision)*
- Refer learners to **Let us learn: 1** on pages 45 and 46 of the Learner's Book. Learners read and write the values for each model.

**Review Exercise****Differentiated Lessons****Low Ability Learners**

- Learners work in pairs and model these numbers using multi-based block.  
1) 289    2) 3,605

**High Ability Learners**

- Working in pairs. Learners model these numbers with multi-based block.  
1) 2,605    2) 5,002

**Assessment For Learning**

Refer learners to Learner's Book page 48 for exercise.

**Suggested Home Work**

Model these numbers using multi-based blocks.

- 1) 685    2) 889    3) 5,000    4) 4,833

## Lesson 2: Describing numbers (5,000 – 10,000) using multi-based block

### Starter

Play '100 more'. Call out a number, learners call out a number which is 100 more.

E.g. 1) 200 → 300      2) 121 → 221  
3) 705 → 805

### Let Us Learn

- Put learners into groups of six. Give out the multi-based block to each group. (At least 9 of each unit.) Revise the names and the values of each unit with learners by picking them one by one for learners mention the names.
- Write numbers for learners to model in their groups. 1) 6,420      2) 8,079      3) 9,999
- In their groups, a leader calls out a number and the rest models it.
- Refer learners to page 47 of the Learner's Book. Go through **Let us Learn: 2** with learners. (*Critical Thinking, Collaborative Learning, Attention to Precision, Problems Solving Skills*)

### Review Exercise

#### Differentiated Lessons

##### Low Ability Learners

- Have learners work in pairs and model these numbers using multi-based block.  
1) 7,064      2) 5,060

##### High Ability Learners

- Learners work in pairs and model these numbers using multi-based block.  
1) 9999      2) 8987      3) 9995

#### Assessment For Learning

Refer learners to Learner's Book page 49 and 50 for exercise.

#### Suggested Home Work

Model these numbers using multi-based block.  
1) 8654      2) 9899      3) 7890

For additional exercises on this module, refer to pages 28 - 32 of the Workbook

**Module 10:** Finding values of digits in numbers**Content Standard**

**B3.1.1.1:** Count and estimate quantities from 0 to 10,000. CONT'D

**Indicator**

**B3.1.1.1.3:** Describe numbers and the relationship between numbers from 0 to 10,000 in equivalent ways using the place value concept.

**Learning Expectations**

Learners will be able to: identify the values of each digit in a given number.

**Essentials For Learning**

Learners can decompose numbers, and can model numbers up to 10,000 using multi-based block.

**New Words**

Value, digit, placement, position, worth

**Resources**

Hundred-frame

Number of Lessons **2**

**Lesson 1** Finding values of digits in a given number.**Starter**

Play: "Guess my Number"

E.g. I am a number. I am a multiple of 10. I lie between 40 and 60, who am I?

**Find Out**

Have learners work in pairs. Refer learners to page 51 of the Learner's Book. They brainstorm to come out with the difference between 42 and 24. Alert them to use the place value if they are finding it difficult. They should justify their answers. (**Collaborative Learning, Critical Thinking, Attention to Precision**).

**Let Us Learn**

- Write the number 242 on the board. Learners expands it as  $200+40+2$ . Now, learners write the value of each digit in the number.

2	4	2
↓	↓	↓
2 hundred	4 tens	2 ones
↓	↓	↓
200	40	2

- Have learners find the values of each digit in 2, 644 in their groups. Learners move round to compare their answers and make

corrections where necessary. (**Critical Thinking, Collaborative Learning, Attention to Precision**)

- Have learners write their own number in pairs and write the value for each digit.
- Refer learners to **Let us learn: 1** on page 51 of the Learner's Book. Learners state the value of each digit in 57. Deduce from learners to identify that the:

**The value of a digit depends upon its placement within a number.**

**Review Exercise****Differentiated Lessons****Low Ability Learners**

What are the values of the underlined digits?

1) 889      2) 5677

**High Ability Learners**

What are the values of the underlined digits?

1) 5,680    2) 6,66    3) 9,974    4) 9,650

**Assessment for Learning**

Refer learners to page 53 of the Learner's Book for exercise.

**Lesson 2:** Reading numbers up to  
1,000**Starter**

Play: "Making 10s"

Mention a number and learners call out another number which when added makes 10.

E.g. 1) 6→4      2) 8→2      3) 7→3

**Let Us Learn**

- Put learners into groups of five. Write these numbers with their number names on the board. Call out some learners to read them.  
1) 685      2) 299      3) 968  
685 → Six hundred and eighty-five.  
299 → Two hundred and ninety-nine.  
968 → Nine hundred and sixty-eight.
- Learners write their own numerals and read them one after the other. (**Critical Thinking, Critical Thinking, Attention to Precision**)
- Have learner understand that reading numbers depends upon the placement/ position of the digits. In a 3-digit number like 789, the seven is seven hundred, the 8 is eighty and the 9 is nine. This is read as seven hundred and eighty-nine.
- Refer learners to **Let us learn: 2** on pages 51 and 52 of the Learner's Book. Go through the exercise with learners. 224 is read as two hundred and twenty-four.

**Review Exercise****Differentiated Lessons****Low Ability Learners**

- Have learners read these numbers in pairs.  
1) 432      2) 678      3) 531

**High Ability Learners**

- Have learners read these numbers in pairs.  
1) 582      2) 789      3) 999      4) 870

**Assessment for Learning**

Refer learners to Learner's Book page 54 for exercise.

**Suggested Home Work**

Write the number names for these numbers and read them.

1) 189      2) 345      3) 659      4) 989

For additional exercises on this module, refer to pages 33 - 34 of the Workbook



**Module 11:** Decomposing numbers up to 10,000**Content Standard**

**B3.1.1.1:** Count and estimate quantities from 0 to 10,000. CONT'D

**Indicator**

**B3.1.1.1.3:** Describe numbers and the relationship between numbers from 0 to 10,000 in equivalent ways using the place value concept

**Learning Expectations**

Learners will be able to decompose numbers up to 5,000.

**Essentials For Learning**

Learners can decompose 3-digit numbers.

**New Words**

Decompose, break apart.

**Resources**

Hundred, frame, multi-based block, numeral cards.

Number of Lessons **2**

## Lesson 1: Decomposing numbers (up to 5,000).

**Starter**

Play: "100 more". Call out a number and learners add 100 to it and call out.

E.g. 1) 500 → 600   2) 658 → 758   3) 899 → 999

**Find Out**

Have learners work in pairs. Refer learners to page 55 of the Learner's Book. They read the numbers and find the value of the underlined numbers. Let them explain and justify their answers. (**Critical Thinking, Justification of Ideas, Collaborative Learning**)

**Let Us Learn**

- Put learners into groups of five. Give out one of these numeral cards to each group to decompose.

168   259   989   678

- Learners move round to compare their answers with other group members. They correct themselves. (**Critical Thinking, Justification of Ideas, Collaborative Learning**)
- Write these numbers on the board.  
a) 1,678   b) 4,648   c) 3,280
- Let learners read the numbers 1678 as one thousand six hundred and seventy-eight. Let them explain the values of each digit.  $1000 + 600 + 70 + 8$ . Draw the hundreds - frame on the board and let them insert the numbers. (**Collaborative Learning, Critical Thinking, Attention to Precision**)

Thousand	Hundred	Tens	Ones
1	6	7	8

- Have learners decompose numbers (b) and (c) in their groups.

Thousand	Hundred	Tens	Ones
4	6	4	8

↓                      ↓                      ↓                      ↓  
4000                  600                      4                      8

- Refer learners to **Let us learn: 1** on page 55 of the Learner's Book. Have learners decompose the numbers 349, 4,567 in pairs using both the expanded form and the hundreds-frame.

**Review Exercise****Differentiated Lessons****Low Ability Learners**

- Learners work in pairs to decompose these numbers. 1) 899   2) 2,344

**High Ability Learners**

- Work in pairs to decompose these numbers. 1) 4688   2) 3,309

**Assessment For Learning**

Refer learners to Exercise 1 on pages 56 and 57 of the Learner's Book.

**Suggested Home Work**

Decompose these numbers.

1) 658   2) 2,340   3) 4899   4) 5000

**Lesson 2:** Decomposing numbers  
(up to 10,000)**Starter**

Play: "100 more". Call out a number and learners add 100 and call out.

E.g. 1) 500→600 2) 658→758 3) 899→999

**Let Us Learn**

- Put learners into groups of five. Write these numbers for learners to decompose into 2 different ways.  
1) 870                      2) 4,685  
 $870 = 800 + 70 = 400 + 400 + 70$   
 $4,685 = 4,000 + 600 + 80 + 5 =$   
 $2000 + 2000 + 600 + 80 + 5$
- Learners move round to observe how other groups decomposed the numbers. They must justify how they got their answers.  
**(Critical Thinking, Collaborative Learning, Justification of Ideas, Attention to Precision)**
- Learners write two numbers between 5,000 and 10,000 on their own and decompose them in two different ways. Learners may decompose in several ways. Have them compare their answers, correct errors and accept whichever way they decomposed them if the answers are correct

- Refer learners to **Let us learn: 2** on pages 55 and 56 of the Learner's Book. They decompose the numbers and insert them in the hundreds frame as well.

**Review Exercise****Differentiated Lessons****Low Ability Learners**

- Decompose these numbers in two different ways. Work in pairs. 1) 4,272 2) 5,664

**High Ability Learners**

- Work in pairs. Decompose these numbers in two different ways. 1) 6,786 2) 9,438

**Assessment For Learning**

Refer learners to Exercise 2 on page 57 of the Learner's Book.

**Suggested Home Work**

Decompose these numbers.

1) 5,623 2) 6,806 3) 8,077 4) 9999

For additional exercises on this module, refer to pages 35 - 37 of the Workbook

**Module 12:** Comparing and ordering numbers (1)**Content Standard**

**B3.1.1.1:** Count and estimate quantities from 0 to 10,000. CONT'D

**Indicator**

**B3.1.1.1.4:** Compare and order whole numbers up to 10,000 and represent comparisons using the symbols  $>$ ,  $<$ , or  $=$ .

**Learning Expectations**

Learners will be able to compare two numbers using the expressions a lot more, a little smaller.

**Essentials For Learning**

Learners can use the place value to compare two numbers and determine the number which is bigger/smaller.

**New Words**

Compare, order, increase, decrease. a lot smaller, a lot bigger, a little bigger, a little smaller

**Resources**

Numeral cards, place value chart.

Number of Lessons **2**

**Lesson 1:** Describing the relative size of numbers.**Starter**

Play: "10 more". Mention a number and learners add 10 to it and call out the number.

E.g. 1)  $13 \rightarrow 23$  2)  $40 \rightarrow 50$  3)  $50 \rightarrow 60$   
4)  $90 \rightarrow 100$

**Find Out**

Refer learners to page 58 of the Learner's Book. Elicit from learners what they can say about the numbers. Let them compare say 158 and 842. They should come out by saying 158 is less than 842 and 842 is larger than 158. Let them compare 160 to 158 and describe the difference. **(Critical Thinking, Collaborative learning, Attention to Precision)**

**Let Us Learn**

- Put learners into sizeable groups. Write these numbers on the board and let them describe the relationship between them. 126 and 526.
- Have learners use place value chart to determine the difference. Both numbers have numbers at the hundred columns but 500 is a lot bigger than 100. So, 526 is a lot bigger than 126, and 126 is a lot smaller than 526.
- In their groups, learners describe the relationship between these numbers  
1) 648 and 230 2) 136 and 128. Have learners critically look at the digits of the hundreds, the tens and the ones columns. Comparing 136 and 128, in the tens

columns, the difference is 10 and in the ones columns the difference is just 2. So, 136 is a little bigger than 128 and 128 is a little smaller than 136.

- Have learners write 2 numbers in their groups and use the expressions learnt to describe the numbers. **(Critical Thinking, Collaborative Learning, Attention to Precision, Problem Solving Skills)**
- Refer learners to **Let us learn: 1** on pages 58 and 59 of the Learner's Book. Learners compare 126, 593, 590 using the expressions learnt. Go through the exercise with learners, by asking leading questions.

**Review Exercise****Differentiated Lessons****Low Ability Learners**

- Work in pairs. Describe these pair of numbers using a lot bigger/smaller, a little bigger/smaller. 1) 268 and 248  
2) 468 and 742. Justify your answers.

**High Ability Learners**

- Work in pairs. Compare these pair of numbers using the expressions learnt. 1) 2,468 and 2,456 2) 7,220 and 3,220 Justify your answers. **(Critical Thinking, Justification of Ideas, Collaborative Learning, Problem Solving Skills)**

**Assessment for Learning**

Refer learners to Exercise 1 on pages 60 and 61 of the Learner's Book.

**Suggested Home Work**

Compare these numbers using the expressions,  
a lot bigger/smaller, a little bigger/smaller than.

- 1) 478 and 467      2) 1,286 and 1,255  
3) 6,782 and 9, 827

## Lesson 2: Comparing 2 numbers using the symbols $<$ , $>$ and $=$

**Starter**

Play: "Making 10 more". Mention a number  
and learners add 10 to it and call out the  
number. E.g. 1)  $13 \rightarrow 23$       2)  $40 \rightarrow 50$   
3)  $50 \rightarrow 60$       4)  $90 \rightarrow 100$

**Let Us Learn**

- Put learners into groups of five. Write these numbers on the board 268 and 320. Have learners find the values of each digit. i.e. looking at the 2 numbers, 300 is greater than 200 so, 320 is greater than 268. Encourage learners to use the symbols. So,  $320 > 268$  and  $268 < 320$ . (**Critical Thinking, Collaborative Learning, Attention to Precision**)
- In pairs have learners compare these numbers.  
786 and 868      b) 428 and 426
- Learners write two numbers on their own and compare them using the symbols  $>$ ,  $=$  and  $<$ . (**Critical thinking, Collaborative Learning, attention to Precision**)

- Refer learners to **Let us learn: 2** on pages 59 and 60 of the Learner's Book. Go through the exercise with learners. Have them compare the numbers (778 and 778) at the hundreds columns, the tens columns and the ones column and draw their own conclusions. That is  $778 = 778$ .

**Review exercise****Differentiated Lessons****Low Ability learners**

- Compare these numbers, using the symbols  $>$ ,  $=$  and  $<$ . Work in pairs.  
1) 428 \_\_\_\_ 482      2) 681 \_\_\_\_ 599

**High Ability Learners**

- Work in pairs. Use the symbols  $>$ ,  $=$  and  $<$  to compare these numbers.  
1) 7896 \_\_\_\_ 7869      2) 9989 \_\_\_\_ 9998  
3) 7650 \_\_\_\_ 7650

**Assessment for Learning**

Refer learners to Exercise 2 on page 61 of the Learner's Book.

**Suggested Home Work**

Use the symbols  $>$ ,  $=$ ,  $<$  to compare these numbers

- 1) 8856 \_\_\_\_ 8856      2) 640 \_\_\_\_ 642  
3) 9872 \_\_\_\_ 8972      4) 8456 \_\_\_\_ 8546

For additional exercises on this module, refer to pages 38 - 39 of the Workbook

**Module 13:** Comparing and ordering whole numbers (2)**Content Standard**

**B3.1.1.1:** Count and estimate quantities from 0 to 10,000. CONT'D

**Indicator**

**B3.1.1.1.4:** Compare and order whole numbers up to 10,000 and represent comparisons using the symbols  $>$ ,  $<$ , or  $=$ .

**Learners Expectations**

Learners will be able to: order numbers in increasing or decreasing order.

**Essentials For Learning**

Learners can use the symbols  $>$ ,  $<$  and  $=$  to compare two numbers.

**New Words**

Order, increasing, decreasing, arrange

**Resources**

Hundred-frame, number line cards, place-value chart, 100 number chart.

Number of Lessons **3**

**Lesson 1:** Ordering numbers**Starter**

Play: "10 more". Mention a number, then learners add 10 and call out the number.

E.g. 1)  $64 \rightarrow 74$       2)  $450 \rightarrow 460$   
3)  $630 \rightarrow 640$       4)  $850 \rightarrow 860$

**Find Out**

Refer learners to **Find out** on page 62 of the Learner's Book. Have learners work in pairs. They write numbers that come before and after 99. Have learners come out with different and several numbers. Expected answers could be

60	99	100	98	99	100
----	----	-----	----	----	-----

**(Critical Thinking, Collaborative Learning, Justification of Ideas)**

**Let us Learn**

- Display the thousand number chart on the board. Revise movement from left to right and vice-versa with learners. Numbers increase by 1 when moving from left to right and decrease by 1 when moving from right to left. With movement downwards, the numbers increase by 10 and decrease by 10 when moving upwards.
- Have learners order these numbers in increasing order 160, 170, 180, 190. Have them order in decreasing order as well. 190, 180, 170, 160.
- In pairs, have learners order these numbers both in ascending and

descending orders. 238, 283, 452, 524. **(Critical Thinking, Collaborative Learning, Justification of Ideas)**

- Refer to **Let us learn: 1** on pages page 62 and 63 of the Learner's Book. Go through the exercise with learners.

**Review Exercise****Differentiated Lessons****Low Ability Learners**

- Work in pairs. Order these numbers in increasing and decreasing orders. 48, 23, 132, 232

**High Ability Learners**

- Work in pairs. Order these numbers in increasing and decreasing orders. 260, 99, 597, 882

**Assessment for Learning**

Refer learners to Learner's Book page 66 for exercise.

**Suggested Home Work**

Order these numbers in increasing and decreasing order.

- 72, 65, 328, 142
- 1,248; 3,785; 999; 332
- 38, 99, 20, 142

## Lesson 2: Ordering numbers using the number line

### Starter

Play: "10 more". Mention a number and learners add 10 more and call out the number.

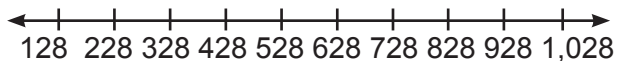
E.g. 1) 64 → 74      2) 450 → 460  
3) 630 → 640      4) 850 → 860

### Let Us Learn

- Write these numbers on numeral cards. 120, 130, 150, 160. Call four learners to pick the numbers randomly. (2 boys and 2 girls)
- Let them come to the front of the class. They should use the number line as a guide. Ask the class to re-order the learners so that the numbers are in order, from the smallest to the largest and vice-versa. Ask the class to tell you the strategies used when ordering numbers.

**(Critical Thinking, Problem Solving Skills, Attention to Precision)**

Draw a number line on the board with these numbers written on it.



- Have learners in groups, order these numbers from the largest to the smallest and vice-versa. Ask learners to tell you the strategies used. 528, 228, 428, 828.
- Write these numbers on the number line 728, 128, 428, 828. Ask learners to reorder them starting from the largest to the smallest and vice-versa. Learners tell you the strategies used. **(Critical Thinking, Collaborative Learning, Problem Solving Skills)**
- Refer learners to **Let us learn: 2** on pages 63 to 64 of the Learner's Book. Go through the exercises on the pages with learners. Numbers increase by 1s to the right and decrease by 1s to the left. Learners look at the number line and write 4 numbers in their groups and arrange them in both increasing and decreasing orders.

### Review Exercise

### Differentiated Lessons

#### Low Ability learners

- Work in pairs. Order these numbers from the smallest to the largest and from the largest to the smallest. 120, 68, 384, 520

#### High Ability Learners

- Work in pairs and order these numbers from 1) largest to smallest  
2) smallest to largest. 378, 2,690, 509, 98

### Assessment for Learning

Refer learners to Learner's Book page 67 for exercise.

### Suggested Home Work

- Order these numbers from the smallest to the largest. 127, 772, 345, 998.
- Order these numbers from the largest to the smallest. 9,280, 3,222, 416, 78.

## Lesson 3: Ordering numbers using place value

### Starter

Play: "Guess my number". E.g. I am thinking of a number; it is more than 600 but less than 620. Learners come out with all numbers between 600 and 620.

### Let Us learn

- Put learners into groups of five. Give each group the hundred number chart and these numbers: 52,722, 26,789, 4,651 and 7,200. Learners insert these numbers in the frame as shown below.

TH	T	H	T	O
5	2	7	2	2
2	6	7	8	9
	4	6	5	1
	7	2	0	0

- Learners in their groups compare the numbers starting from the ten thousand to the ones column and identify the largest number and the smallest number. Learners



reorder the numbers from decreasing to increasing order and vice-versa.

- Refer learners to **Let us learn: 3** on page 65 of the Learner's Book. Go through the exercises with learners. Have learners discuss, the strategies to be used when ordering numbers.
- Ask: Is ordering numbers different from comparing numbers? Give reasons.  
**(Critical Thinking, Problem Solving Skills, Attention to Precision, Collaborative Learning)**

### Review Exercise

### Differentiated Lessons

#### Low Ability Learners

- Work in pairs. Order these numbers from the largest to the smallest. Use the thousand-frame. 120, 326, 1,205.

#### High Ability Learners

- Use the thousand-frame to order these numbers from the smallest to the largest. Work in pairs. 620, 184, 4,652, 9,255

#### Assessment for Learning

Refer learners to Exercise 3 on page 68 of the Learner's Book.

#### Suggested Home Work

Use the thousand-frame to order these numbers from

1. Decreasing to increasing
2. Increasing to decreasing  
6,242, 9,005, 235, 6,451

For additional exercises on this module, refer to pages 40 - 42 of the Workbook

**Module 14:** Comparing and ordering whole numbers (3)**Content Standard**

**B3.1.1.1:** Count and estimate quantities from 0 to 10,000. CONT'D

**Indicator**

**B3.1.1.1.4:** Compare and order whole numbers up to 10,000 and represent comparisons using the symbols  $>$ ,  $<$ , or  $=$ .

**Learning Expectations**

Learners will be able to identify missing numbers on a number line and write them.

**Essentials For Learning**

Learners can compare and order group of numbers in ascending/descending order.

**Resources**

compare, increasing, decreasing, order

**Resources**

Number line cards, hundred charts.

Number of Lessons **2**

**Lesson 1:** Finding missing numbers using the number line**Starter**

Play: "Guess My number". E.g. I am thinking of some numbers; they are more than 10 but less than 15. What are the numbers? The numbers are 11, 12, 13, 14.

**Find Out**

Refer learners to Find Out on page 69 of the Learner's Book. Learners work in pairs and fill in the missing numbers. Elicit from learners the rule they have identified when moving upwards and downwards and from left to right and vice-versa. Learners compare their answers with others and justify their answers. (*Justification of Ideas, Critical Thinking, Collaborative Learning*)

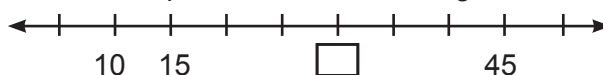
**Let Us Learn**

- Draw a number line on the board, leave out some numbers, learners work in pairs to complete them. They compare their work with others and correct themselves where there are errors. (*Critical thinking, Collaborative Learning, Attention to Precision*)
- Refer learners to **Let us learn: 1** on page 69 of the Learner's Book. Go through the exercises with learners. Elicit from learners to identify the intervals first.
- In exercise 1, the intervals are 5. So, the frog is at 50. In exercise 2 the intervals

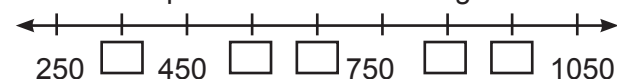
is 10. So, the frog is on 150. (*Critical Thinking, Collaborative Learning, Problems solving Skills*)

**Review Exercise****Differentiated Lessons****Low Ability Learners**

- Work in pairs. Fill in the missing numbers.

**High Ability Learners**

- Work in pairs. Fill in the missing numbers.

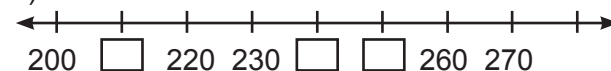
**Assessment for Learning**

Refer learners to Learner's Book page 71 for exercise.

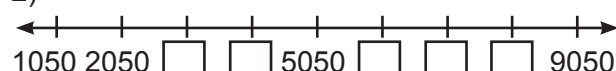
**Suggested Home Work**

Fill in the missing numbers.

1)



2)



## Lesson 2: Finding Missing numbers using charts

## Starter

Play: "Guess My number". E.g. I am thinking of some numbers; they are more than 10 but less than 18. What are the numbers? (The numbers are 11, 12, 13, 14, 15, 16, 17)

## Let Us Learn

- Display the 100 numeral chart on the board. Learners read numbers upwards and downwards from right to left and from left to right.
- Put learners into groups of five. Give out the 100-numeral chart to each group to fill in the empty spaces. Learners justify their answers.

1	2	3	4	5	6		8	9	10
11	12	13	14	15	16	17	18	19	
21	22	23	24	25	26	27	28	29	30
31	32	33	34		36	37	38	39	40
41	42	43		45	46	47	48	49	50
	52	53	54	55	56	57	58	59	60
61	62		64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87		89	90
91		93	94	95	96	97	98	99	100

***(Critical thinking, Collaborative Learning, Justification of Ideas, Problem Solving Skills)***

- Refer learners to **Let us learn: 2** on page 70 of the Learner's Book. Go through the exercise with them. Deduce from learners to come out with the missing numbers they should justify their answers by explaining how they got them.

**(Critical Thinking, Collaborative Learning, Justification of Ideas, Problem Solving Skills)**

## Review Exercise

## Differentiated Lessons

## Low Ability Learners

- Work in pairs. Fill in the missing numbers.

40				
70		72		74

## High Ability Learners

- Work in pairs. Fill in the missing numbers.

	59			
	90			93

## Assessment for Learning

Refer learners to Learner's Book page 72 for exercise.

### Suggested Home Work

Fill in the missing numbers.

1	2	3	4	5		7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22		24	25	26	27	28	29	30
31	32	33	34	35	36		38	39	40
41	42	43	44	45	46	47		49	
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68		
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87		89	90
91	92	93		95	96	97	98		100

For additional exercises on this module, refer to pages 43 - 45 of the Workbook.

**Module 15:** Comparing and ordering whole numbers (4)**Content Standard**

**B3.1.1.1:** Count and estimate quantities from 0 to 10,000. CONT'D

**Indicator**

**B3.1.1.1.4:** Compare and order whole numbers up to 10,000 and represent comparisons using the symbols  $>$ ,  $<$ , or  $=$ .

**Learning Expectations**

Learners will be able to: solve word problems involving comparing quantities up to 1000.

**Essentials For Learning**

Learners can compare and order whole numbers in ascending and descending orders.

**New Words**

Compare, less than, more than.

**Resources**

Word problem cards, 1000 number chart.

Number of Lessons **1**

### Lesson 1: Comparing quantities using word problems.

**Starter**

Play: "10 less". Mention a number and learners reduce it by 10 and call out the number.

**Find Out**

Refer learners to page 73 of the Learner's Book. Have learners talk about the ages of the two learners by comparing them.

1) Ask, who is older? 2) By how many years?

**Let Us Learn**

- Have learners answer these questions orally.
  - I have 2 pencils; Amina has 5 pencils. Who has more? By how many?
  - Teacher Atta has 10 markers; Headteacher has 70. Who has less? By how many?
  - A poultry farmer, Atsu collects 600 eggs a day. Another farmer, Esi collects 500 a day. Who collects more? By how many? (**Problem Solving Skills, Collaborative Learning, Critical Thinking**)
- Learners in pairs pose similar problems and compare them.
- Refer learners to **Let us learn** on page 73 of the Learner's Book. Give out the 1000-number chart to learners. Learners locate 520 and 310 on the chart to identify the greater number. Deduce from learners how they can answer the question "How many more eggs has Afua than Samira?"

**Review Exercise****Differentiated Lessons****Low Ability Learners**

Learners work in pairs.

- Esinam has 20 books, Fati has 15 books. Compare the two numbers. What can you say?
- There are 60 toffees in a box and 100 in a bowl. Compare the number of the toffees. What can you say?

**High Ability Learners**

- Work in pairs.
- Write two word problems containing 2 numbers on your own and compare the numbers.

**Assessment for Learning**

Refer learners to Learner's Book page 74 for exercise.

**Suggested Home Work**

What can you say about these word problems?

- Aunty Ama has 8 children. Aunty Aku has 6 children. Who has more children?
- There are 20 balloons in a red box and 35 in a blue bowl, which bowl has less balloons?
- Write a word problem which compares two different quantities of objects.

For additional exercises on this module, refer to pages 46 - 48 of the Workbook

**Module 16:** Positive and negative numbers (1)**Content Standard**

**B3.1.1.2 :** Develop an understanding of positive and negative numbers.

**Indicator**

**B3.1.1.2.1:** Describe situations having opposite directions or values.

**Learning Expectations**

Learners will be able to: develop an understanding of positive and negative numbers.

**Essentials For Learning**

Learners can identify objects that live in the sea e.g. fishes and those that live above the sea. E.g. animals like cow, hen.

**New Words**

Positive, negative, sea level, above, below.

**Resources**

Pictures of objects in sea. E.g. fishes, octopus, boat, cars, houses.

Number of Lessons **1**

**Lesson 1:** Positive and negative numbers**Starter**

Play: "1 more". Call out a number and learners add 1 to the number and call out.

**Find Out**

Refer learners to page 75 of the Learner's Book. Ask them to talk about the plant.

**Let Us Learn**

- Ask learners to tell you where these objects could be found. Fish, ship, whale. Expected answers, they could be found in the sea. Ask learners to tell you objects which could be found above the sea. E.g. cars, human beings, goats.
- Explain to learners that some objects could be found above the sea. Encourage them to say "above sea level" and "below sea level". Have learners give examples of objects that could be found "above sea level" and those that could be found "below sea level". (**Critical Thinking, Collaborative Learning, Attention to Precision, Justification of Ideas**)
- Refer learners to **Let us learn** on pages 75 and 76 of the Learner's book. Have learners study the picture and mention the objects that are found below the sea. E.g. shells, whale, fish. Learners mention objects that are found above the sea level. E.g. birds, boat, trees, airplane. Make them aware that,
  - Objects found on land are: "above sea level" e.g. birds, trees, houses, cars.
  - Objects found on the sea are: "at sea level" e.g. ship, boat.
  - Objects found below the sea are:

"below sea level" e.g. fish, whale.

(**Critical Thinking, Collaborative Learning, Attention to Precision**)

- Let learners understand that object like ship and boat which are at sea level are represented by zero (0). Below sea levels are considered as negative (-). Above sea levels are considered as positive (+). Have learners give you practical examples. E.g. owing somebody money → negative (-). Having your own money → positive (+)

**Review Exercises**

Whole class activity.

Learners answer whether the statement is positive or negative.

- Borrowing a pencil from a friend \_\_\_\_ - ve
- Borrowing an eraser from a shop. \_\_\_\_ -ve
- Having 3 toffees in your bag. \_\_\_\_ +ve
- Having GH¢ 10.00 in your pocket \_\_\_\_ +ve

**Assessment for Learning**

Refer learners to Learner's Book page 77 for exercise.

**Suggested Home Work**

Write positive or negative beside these statements,

- Mumani has 6 oranges.
- Seiwah collected an eraser from a friend.
- I have GH¢ 50.00 in my money box.
- Ata collected cutlass from Musa.
- Teacher Kwesi has 2 cars.

For additional exercises, refer to pages 49 - 51 of the Workbook.

**Module 17:** Describing situations using positive and negative values**Content Standard**

**B3.1.1.2:** Develop an understanding of positive and negative numbers

**Indicator**

**B3.1.1.2.2:** Use real life contexts to deduce positive and negative number representations

**Learning Expectations**

Learners will be able to: identify positive and negative numbers on number line.

**Essentials For Learning**

Learners know and can give examples of objects below and above 'sea' levels.

**New Words**

Temperature, thermometer, negative, positive, values, Celsius.

**Resources**

Thermometer, ice blocks, electric kettle.

Number of Lessons

1

**Lesson 1:** Positive and negative numbers (2)**Starter**

Play: "2 more". Mention a number and learners add 2 and call out the number.

E.g. 1)  $4 \rightarrow 6$  2)  $8 \rightarrow 10$  3)  $32 \rightarrow 34$

**Find Out**

Refer to page 78 of the Learner's Book.

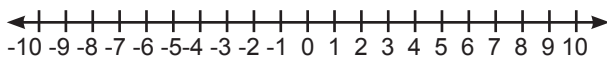
Learners mention the names of the items there and how they are produced.

E.g. ice blocks are formed when the temperature is below  $0^{\circ}\text{C}$  and water boils at  $100^{\circ}\text{C}$ .

Boil water in a kettle. When it boils, ask what is the boiling point?

**Let Us Learn**

- Call out a boy and a girl to the front of the class. Let the girl walk towards you, facing your direction. Let the boy walk towards you with the back facing you. Let the class discuss the two ways they walked towards.
- Draw a number line on the floor indicating zero, negative and positive numbers.



- Call 2 learners to stand on the number line at 0 with their backs facing each other. The learners move on the opposite directions on the number line and call out the numbers as they step on them.

- Repeat this activity several times with different learners. (**Critical thinking, Problem Solving Skills, Collaborative Learning, Attention to Precision**)
- Refer learners to **Let us Learn** on pages 78 and 79 of the Learner's Book. Go through the activities practically with learners.

**Review Exercise**

- Work in groups of four. Ask learners to draw a number line to include -10 and +10. They hop on it one after the other while the rest call out the numbers.

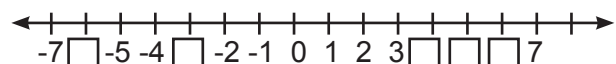
**Assessment for Learning**

Refer learners to Learner's Book page 80 for exercise.

**Suggested Home Work**

Build /draw 3 number lines to include +10 and -10.

Fill in the missing gaps.



For additional exercises on this module, refer to pages 52 - 53 of the Workbook



**Module 18:** Counting forwards and backwards**Content Standard**

**B3.1.1.3:** Identify negative numbers up to -10

**Indicator**

**B3.1.1.3.1:** Describe situations using positive and negative values

**Learning Expectations**

Learners will be able to: count forwards and backwards starting at zero (0).

**Essentials For Learning**

Learners can write positive and negative numbers on the number line.

**New Words**

Forwards, backwards, positive, negative.

**Resources**

Number line cards, positive and negative number line cards.

Number of Lessons **2**

**Lesson 1:** Counting forwards through zero (0).**Starter**

Play: "1 more". Mention a number and let learners add 1 and call out the number. E.g. 1)  $6 \rightarrow 7$  2)  $15 \rightarrow 16$  3)  $30 \rightarrow 31$  4)  $88 \rightarrow 89$

**Find Out**

Have learners work in pairs. Refer them to page 81 of the Learner's Book. Ask these questions:

How are you going to solve these questions?  
Which strategy will you use?

Deduce from learners how they will use counting up and counting back strategy to solve the questions. (**Critical Thinking, Collaboration Learning, Problem Solving Skills**)

**Let Us Learn**

- Learners make a big circle outside/inside the classroom. Draw a number line with +ve and -ve numbers in the middle of the circle. Call out a number and learners hop from 0 to that number. Have more learners take part.  
1) 6 2) -4 3) 8 4) -10 5) 0  
(**Collaborative Learning, Critical Thinking, Attention to Precision**)
- Now ask a learner to stand on - 3. Ask him/her to move 4 steps forwards. The rest tell

the number that he/she will land on. He/she will be on 1. Repeat this activity with different numbers and different learners.

(**Critical Thinking, Collaborative Learning, Attention to Precision**)

- Refer learners to **Let us learn: 1** on page 81 of the Learner's Book. Go through **Exercise a** and **b** with them.

**Review Exercise****Differentiated Lessons****Low Ability Learners**

- Give out number line cards to learners in pairs. They count forwards from these numbers on the number line.  
1)  $-2 + 5 = ?$  2)  $0 + 8 = ?$  3)  $-3 + 7 = ?$

**High Ability Learners**

- Give out number line cards to learners in pairs. Learners count forwards from these numbers on the number line.  
1)  $-5 + 7 = ?$  2)  $-8 + 8 = ?$  3)  $-2 + 7 = ?$

**Assessment for Learning**

Refer learners to Learner's Book page 83 for exercise.

**Suggested Home Work**

Use number line cards to help you find answers to these questions.

- 1)  $-2 + 5 = ?$  2)  $0 + 6 = ?$  3)  $-5 + 7 = ?$   
4)  $10 + 12 = ?$

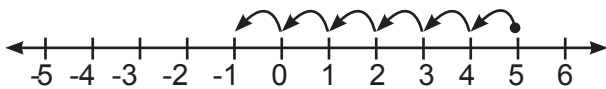
**Lesson 2:** Counting backwards  
through zero (0)**Starter**

Play: "1 more". Mention a number and let learners add 1 and call out the number.

E.g. 1)  $6 \rightarrow 7$  2)  $15 \rightarrow 16$  3)  $30 \rightarrow 31$   
4)  $88 \rightarrow 89$

**Let Us Learn**

- Put learners into groups of ten and make a big circle. Let them draw a number line to include -10 and +10 in the middle of the circle. Give a subtraction sentence card to each group. They use the number line to get the answer. E.g.  $5 - 6 = ?$



- Start at 5, move backwards/count back 6 times and you will land at -1. So  $5 - 6 = -1$ .  
**(Critical Thinking, Problems Solving Skills, Collaborative Learning)**
- Now have learners work in groups of four. Give them number line cards with the subtraction sentence cards. They use the number line card to find answers.

$$4 - 6 = ?$$

$$6 - 10 = ?$$

**(Critical Thinking, Collaborative Learning, Attention to Precision)**

- Refer learners to **Let us learn: 2** on page 82 of the Learner's Book. Go through the exercise with them.

**Review Exercise****Differentiated Lessons****Low Ability Learners**

- Give each pair a number line card to solve these questions.

$$3 - 6 = ?$$

$$2) 6 - 8 = ?$$

**High Ability Learners**

- Have learners work in pairs. They can use the number line.

$$1) 6 - 8 = ?$$

$$2) 12 - 13 = ?$$

$$3) 9 - 14 = ?$$

**Assessment for Learning**

Refer learners to Exercise 2 on page 84 of the Learner's Book.

**Suggested Home Work**

Solve these questions.

$$1) 5 + 7 = ?$$

$$2) 9 - 9 = ?$$

$$3) 4 - 12 = ?$$

$$4) 2 - 8 = ?$$

For additional exercises on this module, refer to pages 54 - 58 of the Workbook.

Encourage learners to do the reflection exercises on pages 85 and 86 after this sub-strand.

Learners complete the self-assessment table on page 87. This will help you know each learner's strength and weaknesses.

**Module 1:** Addition and subtraction facts (fluency 1)**Content Standard**

Develop and use standard strategies for adding and subtracting within 1000.

**Indicator**

**B3.1.2.1.** : Use standard strategy or procedure to do addition or subtraction within 1000

**Learning Expectation**

Learners will be able to use different strategies to find unknown in addition/ subtraction sentences.

**Essentials for Learning**

Learners can do addition and subtraction using counting up/down and friendly jumps strategies.

**New Words**

Unknown, partition, solve, count on, count down, decompose, subtract.

**Resources**

Number line cards, bottle caps, bowls, pebbles.

Number of Lessons **2**

**Lesson 1:** Finding unknown in addition sentence**Starter**

Play; "Guess my number". E.g. I am thinking of a number. It is a multiple of 10. It is bigger than 70 but less than 90. What is the number?

**Find Out**

Refer learners to page 88 of the Learner's Book. Have them work in pairs

Ask: "How do you find the unknown? Explain the strategy you will use to your partner."

**Let Us Learn**

- Put three bowls on your table, count 10 bottle caps with learners and put them in the first bowl. Count another 30 bottle caps and put them in the third bowl.
- Ask: "How many bottle caps should I put in the second bowl so that when I add the numbers in the first and second bowls, the sum will be 30 as in the third bowl?"
- Learners brainstorm in their groups to find the solution. The question could be written as  $10 + \text{what} = 30$ . Now, "what" is the unknown. Represent "what" with a box. So  $10 + \square = 30$ . (**Problem solving skills, critical thinking, collaborative learning**) Learners in their groups repeat the activity several times with different numbers.
- Give the bottle caps and bowls to learners. They repeat activity one in their groups. They create their own word problems and solve them.

- Refer learners to **Let us learn: 1**, Examples 1 - 3 on page 88 of the Learner's Book. Learners in their group write the addition sentence as  $20 + \square = 35$  and solve it. Go through the other exercises with learners. Ask the following questions to test learners understanding.
  - \* What symbol do we use for unknown?
  - \* When do we use the unknown symbol?

**Review Exercise****Differentiated lessons****Low Ability Learners**

- Find the unknown in these statements to make the sentences true.
 

1)  $60 + \square = 100$     2)  $145 + \square = 245$

**High Ability Learners**

- Use a symbol to find the unknown and solve the addition problem. Yaa Yeboah has 160 counters. Her grandmother gave her some more. She now has 670. How many did her grandmother give her?

**Assessment for Learning**

Refer learners to Exercise 1 on page 91 of the Learner's Book.

**Suggested Home Work**

Find the unknown numbers in these sentences.

- 1)  $320 + \square = 840$     2)  $600 + \square = 1000$

3)  $410 + \square = 485$

- 4) Dankwah has 250 crates of eggs to sell. Another farmer brought her more. She now has 800 crates. How many crates of eggs did the farmer give her?

## Lesson 2: Finding unknown in subtraction sentences.

### Starter

Play; "Guess my number". E.g. I am thinking of a number. It is a multiple of 10. It is bigger than 70 but less than 90. What is the number?

### Let Us Learn

- Put learners into groups of five. Write these sentences on the board. Have learners interpret the sentence and solve them. Make sure they mention the unknown as "What" and represent it with a box.

1)  $120 - \square = 60$       2)  $272 - \square = 222$

Have learners compare their work and the strategies they used to find the unknown.

**(Critical thinking, collaborative learning, personal development).**

- Refer learners to Learner's Book page 90. Go through **Let us learn: 2** with learners.  $373 - \square = 325$ . Deduce from learners what strategy they will use to get the answer.

### Review Exercise

Ask:

What symbol do we use for the unknown? Why?

After using the symbol, how do you get the answer?

### Differentiated Lessons

#### Low Ability Learners

- Work in pairs to solve these subtraction sentences. 1)  $68 - \square = 13$

2)  $246 - \square = 46$

#### High Ability Learners

- Work in pairs to solve these subtraction sentences. 1)  $268 - \square = 132$

2)  $350 - \square = 125$

### Assessment for Learning

Refer learners to Exercise 2 on page 91 of the Learner's Book.

### Suggested Home Work

1)  $79 - \square = 30$       2)  $298 - \square = 123$

3)  $652 - \square = 320$

- 4) Agya Ata has 680 cocoa seedlings. Some got rotten so he now has 420. How many got rotten?

For additional exercises on this module, refer to pages 59 - 61 of the Workbook.

**Module 2:** Addition and subtraction facts (fluency 2)**Content Standard**

Develop and use standard strategies for adding and subtracting within 1000.

**Indicator**

**B3.1.2.1.1:** Use standard strategy or procedure to do addition or subtraction within 1000

**Learning Expectations**

Learners will be able to solve addition and subtraction sentences using decomposition strategy.

**Essentials for Learning**

Learners can solve addition and subtraction sentences within 100.

**New Words**

Decompose.

**Resources**

Numeral cards, number line cards.

Number of Lessons **2****Lesson 1:** Addition (using decomposition strategy).**Starter**

Play: "100 more". Call out a number and learners add 100 and call out the number.

E.g. 1) 50 → 150    2) 306 → 460  
3) 700 → 800

**Find Out**

Refer learners to page 92 of the Learner's Book.

Have learners work in pairs. Ask:

Can you add 7 and 2? Why?

Can you add 8 and 3? Why?

Elicit from learners why they can add 7 and 2 but cannot add 8 and 3.

**Answer:** You can add 7 and 2 because they are in the tens column. You cannot add 8 and 3 because 8 is in the hundreds column while 3 is in the ones column. (**Problem solving skills, critical thinking, collaborative learning**).

**Let Us Learn**

- Write these numbers on the board. Have learners decompose them into hundreds, tens and ones.  
1)  $265 \rightarrow 200 + 60 + 5$   
2)  $689 \rightarrow 600 + 80 + 9$
- Now learners write their own numbers and decompose them into hundreds, tens and ones. They compare their work with the nearest learner.  
Write these addition sentences on the board for learners to solve in pairs.

$$1) 165 + 233$$

$$\begin{array}{r} 165 \\ \downarrow \\ 100 + 60 + 5 \end{array} \quad \begin{array}{r} 233 \\ \downarrow \\ 200 + 30 + 3 \end{array}$$

$$100 + 200 = 300 \text{ (adding hundreds)}$$

$$60 + 30 = 90 \text{ (adding tens)}$$

$$5 + 3 = 8 \text{ (adding ones)}$$

$$300 + 90 + 8 = 398$$

$$2) 504 + 336$$

$$\begin{array}{r} 504 \\ \downarrow \\ 500 + 00 + 4 \end{array} \quad \begin{array}{r} 336 \\ \downarrow \\ 300 + 30 + 6 \end{array}$$

$$500 + 300 = 800 \text{ (adding hundreds)}$$

$$00 + 30 = 30 \text{ (adding tens)}$$

$$4 + 6 = 10 \text{ (adding ones)}$$

$$800 + 30 + 10 = 800 + 40 = 840$$

- Refer learners to Learner's Book page 92. Go through **Let us learn: 1** questions with learners.

**Review Exercise**

Ask:

How do you decompose 3-digit numbers?

How do you decompose 2-digit numbers?

**Differentiated Lessons****Low Ability Learners**

- Work in pairs. Solve these addition sentences.  
1)  $62 + 27 = \square$   
2)  $436 + 264 = \square$

**High Ability Learners**

- Work in pairs.  
1)  $128 + 282$   
2)  $436 + 264$

**Assessment for Learning**

Refer learners to Exercise 1 on pages 94 and 95 of the Learner's Book for exercise.

**Suggested Home Work**

Use decomposition strategy to solve these addition sentences.

- 1)  $644 + 166$                       2)  $464 + 125$   
3)  $482 + 333$                       4)  $672 + 352$

**Lesson 2:** Addition (using friendly jump strategy).**Starter**

Play: "100 more". Call out a number for learners to add 100 and call out the number.  
E.g. 1)  $50 \rightarrow 150$  2)  $306 \rightarrow 460$  3)  $700 \rightarrow 800$

**Let Us Learn**

- Write this subtraction sentence on the board.  $346 - 225 = ?$ .  
Explain to learners that they can decompose the two numbers and subtract or decompose the second number (subtrahend) and use friendly jumps to subtract.  
Have learners decompose:  
 $346$  as  $300 + 40 + 6$  and  
 $225$  as  $200 + 20 + 5$ .  
 $300 - 200 = 100$  (subtracting hundreds)  
 $40 - 20 = 20$  (subtracting tens)  
 $6 - 5 = 1$  (subtracting ones)  
So  $346 - 225 = 121$

- Learners compare and discuss the strategy they used to get the answer. Working in pairs, they write one subtraction sentence and solve. (*critical thinking, problem solving skills, attention to precision*).
- Refer learners to **Let us learn: 2** on pages 93 and 94 of the Learner's Book. Go through the questions with learners.

**Review Exercise****Differentiated lessons****Low Ability Learners**

Work in pairs. Solve these subtraction sentences. 1)  $68 - 35 = ?$       2)  $267 - 135 = ?$

**High Ability Learners**

Work in pairs. Solve these subtraction sentences. 1)  $485 - 265 = ?$  2)  $567 - 368 = ?$

**Assessment for Learning**

Refer learners to Exercise 2 on pages 95 and 96 of the Learner's Book.

**Suggested Home Work**

Solve these using decomposition strategy.  
1)  $278 - 132 = ?$       2)  $835 - 422 = ?$   
3)  $543 - 241 = ?$       4)  $700 - 427 = ?$

For additional exercises on this module, refer to pages 62 - 65 of the Workbook



## Module 3: Addition &amp; subtraction

**Constant Standard**

**B3.1.2.2:** Demonstrate an understanding of the concept of “equality” and “not equal to” in addition and subtraction problems with sums up to 1000.

**Indicator**

**B3.1.2.2.1:** Use the concept of “equal to” and “not equal to”

**Learning Expectation**

Learners will be able to use the concept of “equal to” and “not equal to” to make addition and subtraction sentences true.

**Essentials for Learning**

Learners can compare numbers, using the symbols  $<$ ,  $>$  and  $=$ .

**New Words**

Same as, not equal to, equals to, symbols, equals.

**Resources**

Balance scale, bottle caps, pebbles, symbol cards, numeral cards.

Number of Lessons **2****Lesson 1:** Using the symbols  $=$  and  $\neq$  to make sentences true (1).**Starter**

Play: “Which is greater”. Mention 2 numbers and learners call out the one which is greater.  
E.g. 1) 23 and 32      2) 150 and 250  
3) 148 and 481

**Find Out**

Refer learners to page 97 of the Learner's Book. Learners look at the 2 scales and compare them. They should work in pairs.

Ask:

What can you say about scale AD?

What can you say about scale CD?

Expected answers: The weights of A and D are the same, but C and D are not the same. C is heavier than B.

**Let Us Learn**

- Put learners into groups of five. Give each group 20 bottle caps and the 2 symbol cards. Learners divide them into two equal parts. Ask learners to tell you how many are in each set.  
Expected answer: they are the same.
- Introduce the symbol for equal to ‘ $=$ ’ to learners. Ask them to pick it and place it between the two groupings. (**Critical thinking, collaborative learning, attention to precision**).

- Now, ask learners to put them into two un-equal groupings. E.g. 15 and 5, 8 and 12, 7 and 13. Learners will have different groupings. Ask learners to describe the two groupings that they have made.  
Expected answers: they are not the same, they are not equal.
- Introduce the symbol for not equal ‘ $\neq$ ’ to them. Ask them to pick it and place it between the two groupings. (**Critical thinking, collaborative learning, leadership skills**)
- Have learners repeat the same activity with 30 bottle caps. They should use the ‘ $\neq$ ’ to compare.
- Refer learners to **Let us learn: 1** on pages 97 to 99 of the Learner's Book. Go through Examples 1 and 2 with learners. Have them compare the number of bottle caps and the cups in Example 1 and the number of stars and triangles in Example 2. Let them draw conclusions for them.

**Review Exercise**

Ask:

- When do we use equal to symbol?
- When do we use not equal to symbol?

Learners work in pairs. Give out 22 straws to each group. They make three unequal and one equal groupings.

**Assessment for Learning**

Refer learners to Learner's Book page 100 for exercise.

**Suggested Home Work**

Make three unequal and one equal groupings of 20 bottle caps by drawing.

## Lesson 2: Using the symbols = and $\neq$ to make sentences true (2).

**Starter**

Play: "Which is greater". Mention two numbers and learners call out the number which is greater. E.g. 1) 23 and 32 2) 150 and 250  
3) 148 and 481

**Let Us Learn**

- Put learners into groups of five. Write this sentence on the board.
- 1)  $50 \underline{\hspace{1cm}} 30 + 20$  2)  $120 \underline{\hspace{1cm}} 80 + 70$ . Elicit from learners the appropriate symbol to insert to make the statements true. For question 1 learners add 30 to 20 which is 50. So,  $50 = 50$ . For question 2  $80 + 70 = 150$  so  $120 \neq 150$  (**critical thinking, collaborative learning, attention to precision**).
- Write 35 on the board. In pairs learners write 3 statements which are not equal to 35.
- Refer learners to **Let us learn: 2** on page 99 of the Learner's Book. Go through the activities with learners.

**Review Exercise**

Ask:

When do we use the symbol = ?

When do we use the symbol  $\neq$  ?

**Differentiated lessons****Low Ability Learners**

- Work in pairs. Write one equal and two unequal statements with the number 30.

**High Ability Learners**

- Work in pairs. Write one equal and 3 unequal statements with the number 90.

**Assessment for Learning**

Refer learners to Learner's Book page 101 for exercise.

**Suggested Home Work**

Insert the symbol = or  $\neq$  to make the statements true.

$$120 \underline{\hspace{1cm}} 80 + 40$$

$$120 \underline{\hspace{1cm}} 100 + 30$$

$$45 + 40 \underline{\hspace{1cm}} 100$$

$$245 \underline{\hspace{1cm}} 200 + 50$$

For additional exercises on this module, refer to pages 66 - 68 of the Workbook

**Module 4:** Relationship between addition and subtraction**Content Standard**

**B3.1.2.2:** Demonstrate an understanding of the concept of "equality" and "not equal to" in addition and subtraction problems with sums up to 1000.

**Indicator**

**B3.1.2.2.1:** Use the concept of "equal to" and "not equal to"

**Learning Expectation**

Learners will be able to describe a subtraction sentence as an equivalent addition sentence and vice-versa.

**Essentials for Learning**

Learners can solve addition and subtraction sentence within 100.

**New Words**

Equivalent, relationship.

**Resources**

Numeral cards, bottle caps.

Number of Lessons **2****Lesson 1:** Changing addition sentence into subtraction sentence**Starter**

Play: "Adding 10". Mention a number and learners add 10 and call out the number. E.g.  
1)  $25 \rightarrow 35$     2)  $70 \rightarrow 80$     3)  $85 \rightarrow 95$

**Find Out**

Refer learners to page 102 of the Learner's Book. Ask learners to pick two numbers which, when added, or subtracted, gives an answer 22. Expected answers:  $10+12$  and  $36-24 = 22$ . Elicit from learners how they got the answers (**Problem solving skills, Critical thinking, collaborative learning**)

**Let Us Learn**

- Put learners into sizeable groups. Give them numeral cards. Learners decompose them and write sentences which describe the relationship between addition and subtraction.

E.g. 24       $10 + 14 = 24$

↓  
 $10+14$        $14 + 10 = 24$   
                  $24 - 10 = 14$   
                  $24 - 14 = 10$

These describe the relationship between addition and subtraction.

- Write  $38 + \square = 60$ . This could be re-written as  $60 - 38 = \square$ . Let learners

decompose the numbers and solve it

$60 - 38$   
↓                    ↓  
 $30 + 30$        $30 + 8$   
 $30 + 30 - 30$

$30 - 8 = 22$  (**critical thinking, collaborative learning, attention to precision**)

- Refer learners to **Let us Learn: 1** on page 102 and 103 of the Learner's Book. Go through the example first with learners.  
 $16 + \square = 28$ .

Now go through the two questions with learners as well.

1)  $49 + \square = 84$ . Learners change it to  $84 - 49 = \square$ , and use decomposition strategy to solve it.

2)  $345 + \square = 562$  becomes  
 $562 - 345 = \square$

**Review Exercise**

Ask learners: Can you change addition sentence into subtraction sentence? How do you go about it?

**Differentiated lessons****Low Ability Learners**

- Work in pairs. Change these addition sentences into subtraction sentences and solve them.

$45 + \square = 60$     2)  $135 + \square = 140$

**High Ability Learners**

- Work in pairs. Change these addition sentences into subtraction sentences and solve them.

$$132 + \square = 164$$

$$2) 84 + \square = 120$$

**Assessment for Learning**

Refer learners to Exercise 1 on page 105 of the Learner's Book.

**Suggested Home Work**

Change the addition sentences into subtraction sentences and solve them.

$$1) 56 + \square = 99$$

$$2) 210 + \square = 450$$

$$3) 80 + \square = 120$$

$$4) 123 + \square = 276$$

## Lesson 2: Changing subtraction sentence into addition sentence

**Starter**

Play: "Adding 10". Mention a number for learners to add 10 to it and call out the number.  
E.g. 1)  $25 \rightarrow 35$  2)  $70 \rightarrow 80$  3)  $85 \rightarrow 95$

**Let Us Learn**

- Put learners into groups of five. Write this sentence on the board and ask learners to explain the meaning.  $65 - 33 = 32$ . This means  $65 - 33 = 32$  which is the same as  $33 + 32 = 65$
- Let learners change this to addition sentence and solve it  $52 - \square = 25$ . This is the same as  $25 + \square = 52$   
 $\rightarrow 52 - 25 = \square$ .

- Learners use any addition strategy to solve the question.  
Have learners write their own subtraction sentences and solve them (*problem solving kills, collaborative learning, critical thinking*)
- Refer learners to **Let us learn: 2** on page 104 of the Learner's Book. Go through the questions with them.

**Review Exercises****Differentiated lessons****Low Ability Learners**

- Solve these questions. 1)  $75 - \square = 30$   
2)  $39 - \square = 20$

**High Ability Learners**

- Work in pairs. Solve these subtraction problems.
- $$1) 73 - \square = 60 \quad 2) 58 - \square = 50$$
- $$3) 250 - \square = 100 \quad 4) 96 - \square = 25$$

**Assessment for Learning**

Refer learners to Exercise 2 on page 105 of the Learner's Book.

**Suggested Home Work**

Solve these questions.

$$1) 82 - \square = 62$$

$$2) 100 - 40 = \square$$

$$3) 90 - \square = 68$$

$$4) 70 - \square = 65$$

For additional exercises on this module, refer to pages 69 - 70 of the Workbook.

## Module 5: Addition strategies (1)

**Content Standard**

**B3.1.2.3:** Develop and use strategies for mentally computing basic addition and subtraction facts within 100

**Indicator**

**B3.1.2.3.1:** Use strategies to mentally add and subtract whole numbers within 100

**Learners Expectations**

Learners will be able to demonstrate mastery of addition facts up to 18.

**Essentials for Learning**

Learners can do addition with sum up to 100.

**New Words**

Count back, subtract, minued, subtrahend

**Resources**

N numeral cards, bottle caps, straws.  
Lesson 1: Making Addition Facts.

Number of Lessons 1

## Lesson 1: Making addition facts

**Starter**

Play: "Making Doubles". Call out a number and learners double it.

E.g. 1)  $10 \rightarrow 20$     2)  $4 \rightarrow 8$     3)  $20 \rightarrow 40$   
4)  $50 \rightarrow 100$

**Find Out**

Have learners work in pairs. Refer learners to page 106 of the Learner's Book. Ask learners how they can find the missing number. Expected answer is 8. Learners discuss among themselves how they got the answer.

**Let Us learn**

- Put learners into groups of six.  
Demonstrate how a fact family could be gotten given 3 numbers.  
Given 8, 12 and 20  
 $12 + 8 = 20$   
 $8 + 12 = 20$   
 $20 - 12 = 8$   
 $20 - 8 = 12$
- Write these on the board for learners to write the fact family. 3, 9 and 12.  
 $3 + 9 = 12$   
 $9 + 3 = 12$   
 $12 - 3 = 9$   
 $12 - 9 = 3$   
Have learners compare their answers with other groups and correct themselves.
- Refer learners to **Let us learn** on page 106 of the Learner's Book. In pairs, learners find the fact family for these numbers. 12, 10 and 2.

**Review Exercise****Low Ability Learners**

- Find the fact family for these numbers 6, 4 and 10

**High Ability Learners**

- Find the fact family for these numbers:  
a) 26, 9 and 35    b) 90, 18 and 108.

**Assessment for Learning**

Refer learners to Learner's Book page 107 for exercise.

**Suggested Home Work**

Given the fact family, solve these sentences. 9, 8 and 17

1    9, 8 and 17

a)  $9 + 8 = \square$

b)  $8 + 9 = \square$

c)  $17 - 9 = \square$

d)  $17 - \square = 9$

2    12, 8 and 20

a)  $12 + 8 = \square$

b)  $8 + \square = 20$

c)  $20 - \square = 12$

d)  $20 - 12 = \square$

For additional exercises on this module, refer to pages 71 - 73 of the Workbook.

## Module 6: Addition strategies (2)

## Content Standard

**B3.1.2.3:** Develop and use strategies for mentally computing basic addition and subtraction facts within 100

## Indicator

**B3.1.2.3.1:** Use strategies to mentally add and subtract whole numbers within 100

## Learning Expectations

Learners will be able to use 'Making Doubles Strategy' to find addition sum.

## Essentials for Learners

Learners can solve addition problems with sum up to 100.

## New Words

Double, move part, decompose.

## Resources

Objects which are in doubles. E.g. spectacles, shoes, feet.

Number of Lessons **2**

## Lesson 1: Making doubles to add

## Starter

Play: "Making Doubles". Mention a number and learners double it. E.g. 1)  $3 \rightarrow 6$     2)  $6 \rightarrow 12$   
3)  $10 \rightarrow 20$     4)  $20 \rightarrow 40$

## Find Out

Refer learners to **Find out** on page 108 of the Learner's Book. Learners working in pairs talk about what is in the picture. Deduce from learners the number of toes that are on each foot? What is the total? (**Critical thinking, collaborative learning, attention to precision**).

## Let Us Learn

- Call out different numbers and learners write down the doubles. E.g.  $1 \rightarrow 2$ ,  $4 \rightarrow 8$ ,  $9 \rightarrow 18$ ,  $10 \rightarrow 20$ .
- Put learners into convenient groups. Write this addition sentence on the board.  $20 + 28 = \text{what}$ . Elicit from them whether they can make double of any of the numbers for easy addition. Because 28 is more than 20, learners have to decompose 28 as  $20 + 8$ , to get double of 20. The sentence now reads  $20 + 20 + 8 = 40 + 8 = 48$ . (**critical thinking, collaborative learning**)
- Write these on the board for learners to use doubles to add. They should work in pairs. 1)  $30 + 39 = ?$  2)  $25 + 15 = ?$ . Learners compare their answers

with others and make corrections where necessary. (**Critical thinking, collaborative learning, leadership skills**).

- Refer learners to **Let us Learn: 1** on page 108 of the Learner's Book. Go through **Example 1** and **2** with learners.

## Review Exercise

Ask the following questions.

- How do you get doubles of a number?
- What strategy do you use to get doubles?

## Differentiated Lessons

## Low Ability Learners

- Work in pairs. Solve these. Use making doubles.  
1)  $10 + 18 = ?$     2)  $29 + 20 = ?$

## High Ability Learners

- Work in pairs. Solve these. Use making doubles.  
1)  $38 + 33 = ?$     2)  $75 + 50 = ?$

## Assessment for Learning

Refer learners to Exercise 1 on page 110 of the Learner's Book for exercise.

## Suggested Home Work

Use doubles to solve these addition sentences.

- $50 + 60 = ?$     2)  $22 + 18 = ?$
- $40 + 30 = ?$     4)  $68 + 50 = ?$



## Lesson 2: Making doubles or friendly numbers to add

### Starter

Play: "Making doubles". Mention a number and learners double it and call out the number.

E.g. 1)  $3 \rightarrow 6$     2)  $6 \rightarrow 12$     3)  $10 \rightarrow 20$   
4)  $20 \rightarrow 40$

### Let Us Learn

- Put learners into groups of five. Write this on the board.  $21 + 23 = ?$ . Ask learners to discuss how to get doubles from it.  
 $21 + 23 = ? \rightarrow 22 + 22$  (move 1 from 23 and add to 21 to get 22)  
The sentence now reads  $22 + 22 = ?$   
 $22 + 22 = 44$ , so  $21 + 23 = 44$ .
- Let learners practice these:  
1)  $19 + 21 = ?$     2)  $29 + 30 = ?$   
**(critical thinking, collaborative learning, leadership skills)**
- Write this addition sentence on the board.  
 $59 + 38 = ?$ .  
Demonstrate how to solve it with learners.  
 $59 + 38 = ? \rightarrow 60 + 37$  (move 1 from 38 and add to 59 to get 60).  
The sentence now reads  
 $60 + 37 = ?$   
 $60 + 37 = 97$ , so  $59 + 38 = 97$ .  
Have learners practice these:  
1)  $39 + 14 = ?$     2)  $48 + 34 = ?$

- Refer learners to **Let us Learn: 2** on page 109 of the Learner's Book. Go through questions 1 and 2 with learners.  $36 + 38 = ?$   
Elicit from learners how they can make doubles from that question. Learners have to decompose 38 as  $37 + 1$  so the question now reads  $37 + 37 = 74$  so  $36 + 38 = 74$ .

### Review Exercise

#### Differentiated Lessons

Work in pairs. Use making doubles Strategy to solve these addition sentences.

#### Low Ability Learners

1)  $19 + 21 = ?$     2)  $29 + 18 = ?$

#### High Ability Learners

1)  $22 + 24 = ?$     2)  $49 + 51 = ?$

#### Assessment for Learning

Refer learners to Learner's Book page 110 for exercise 2.

#### Suggested Home Work

Solve these addition sentences. Use making doubles.

1)  $15 + 18 = ?$     2)  $35 + 31 = ?$   
3)  $37 + 15 = ?$     4)  $77 + 29 = ?$

For additional exercises on this module, refer to pages 74 - 77 of the Workbook

## Module 7: Addition Strategies (3)

**Content Standard**

**B3.1.2.3:** Develop and use strategies for mentally computing basic addition and subtraction facts within 100.

**Indicator**

**B3.1.2.3.1:** Use strategies to mentally add and subtract whole numbers within 100.

**Learning Expectation**

Learners will be able to solve addition problems using a variety of strategies.

**Essentials for Learning**

Learners can use 'making doubles' to solve addition problems.

**New Words**

Decompose, doubles, move part.

**Resources**

Numeral cards, number line cards.

Number of Lessons **3****Lesson 1: Making 10s to add****Starter**

Play; "Making doubles". Mention a number and learners double it and call out the number.

E.g. 1)  $5 \rightarrow 10$       2)  $10 \rightarrow 20$   
3)  $15 \rightarrow 30$       4)  $50 \rightarrow 100$

**Find Out**

Refer learners to page 111 of the Learner's Book.

Learners work in pairs. Ask:

Why do you have to add 1 from the red to the black to the 9 blacks?

Which one is easier: adding 9 and 3 or adding 10 and 2? Learners brainstorm and answer the question.

**Let Us Learn**

- Have learners work in groups of five. Write this sentence on the board.  $18 + 27 = ?$   
Elicit from learners how they can make one of the two numbers multiples of 10.  $18 + 27 = ?$

Learners discuss which of the two numbers to use. Learners can move 2 from 27 and add to 18 to make 20. So,  $18 + 27$  now reads  $20 + 25 = 45$  or learners can move 3 from 18 and add to 27 to make 30. So, the question now reads  $15 + 30 = 45$  so,  $18 + 27 = 45$ .

- Have learners practice these in pairs.  
1)  $37 + 43 = ?$       2)  $28 + 47 = ?$  (**critical thinking, collaborative learning, problem solving skills**)
- Refer learners to **Let us learn: 1** on page 111 of the Learner's Book.

$38 + 29 = ?$  Deduce from learners which number they will make multiples of 10 and why? Learners can work in two different ways. First, they can make 29 multiples of 10, by moving 1 from 38. Secondly, they can make 38 multiples of 10 by moving 2 from 29.

**Review Exercise**

Ask learners the following questions.

- Why do you have to make one of the numbers multiple of 10s?
- How do you make a number a multiple of 10?

**Differentiated lessons**

Add: Make multiples of 10s first.

**Low Ability Learners**

1)  $19 + 23 = ?$       2)  $37 + 18 = ?$

**High Ability Learners**

1)  $63 + 37 = ?$       2)  $72 + 35 = ?$

**Assessment for Learning**

Refer learners to Exercise 1 on page 113 of the Learner's Book for exercise.

**Suggested Home Work**

Use making 10s to solve these addition sentences.

1)  $47 + 29 = ?$       2)  $39 + 35 = ?$   
3)  $29 + 81 = ?$

## Lesson 2: Addition (using decomposition)

### Starter

Play: "Making Doubles". Mention a number and learners double it and call out the number.

E.g. 1)  $3 \rightarrow 6$       2)  $6 \rightarrow 12$   
 3)  $10 \rightarrow 20$       4)  $20 \rightarrow 40$

### Let Us Learn

- Put learners into groups of five. Write this addition sentence on the board.  
 $33 + 26 = ?$ .  
 Have learners decompose the second number as  $10 + 10 + 6$ . Learners add starting from the first number, 33 and make jumps to get the answer.  
 $33 + 10 + 10 + 6 = 56$ .
- Have learners go over the steps. Write these for learners to solve. 1)  $52 + 35$   
 2)  $66 + 22 = ?$  (**critical thinking, collaborative learning, attention to precision**)
- Refer learners to **Let us Learn: 2** on page 112 of the Learner's Book page 112. Go through the activities with learners.

### Review Exercise

#### Differentiated Lesson

Work in pairs. Solve these. Use decomposition strategy.

#### Low Ability Learners

1)  $22 + 35 = ?$       2)  $18 + 21 = ?$

#### High Ability Learners

1)  $47 + 36 = ?$       2)  $39 + 55 = ?$

#### Assessment for Learning

Refer learners to Exercise 2 on page 114 of the Learner's Book.

#### Suggested Home Work

Decompose one number and solve these addition sentences.

1)  $57 + 28 = ?$       2)  $35 + 31 = ?$   
 3)  $42 + 36 = ?$       4)  $60 + 35 = ?$

## Lesson 3: Addition (adding 10s column first)

### Starter

Play: "Making Doubles". Mention a number and learners double it and call out the number.

1)  $3 \rightarrow 6$       2)  $6 \rightarrow 12$       3)  $10 \rightarrow 20$

### Let Us Learn

- Have learners work in groups of five. Write this on the board.  $26 + 34 = ?$  Ask learners to break the numbers into 10s and ones. Add the tens first before the ones. E.g.

$$\begin{array}{r} 26 \\ \downarrow \\ 20 + 6 \\ 20 + 30 \\ 50 \end{array} + \begin{array}{r} 34 \\ \downarrow \\ 30 + 4 \\ 6 + 4 \\ 10 = 60 \end{array}$$

- Give more examples for learners to work in groups and in pairs. E.g.  
 1)  $26 + 21 = ?$       2)  $32 + 47 = ?$   
 3)  $24 + 13 = ?$  (**critical thinking, collaborative learning, attention to precision**)
- Refer learners to **Let us Learn: 3** on pages 112 and 113 of the Learner's Book. Go through the exercises with learners.

### Review Exercise

How do you add from left to right? Discuss with your partner.

#### Differentiated Lessons

Solve these addition sentences.

#### Low Ability Learners

1)  $23 + 32$       2)  $44 + 36$

#### High Ability Learners

1)  $45 + 33 = ?$       2)  $56 + 28 = ?$

#### Assessment for Learning

Refer learners to Exercise 3 on page 144 of the Learner's Book.

#### Suggested Home Work

Work these addition sentences from left to right. 1)  $23 + 35 = ?$       2)  $57 + 22 = ?$

3)  $44 + 24 = ?$       4)  $60 + 17 = ?$

For additional exercises on this module, refer to pages 78 - 81 of the Workbook

## Module 8: Subtraction strategies (1)

**Content Standard**

**B3.1.2.3:** Develop and use strategies for mentally computing basic addition and subtraction facts within 100

**Indicator**

**B3.1.2.3.2:** Use strategies to mentally add and subtract whole numbers within 100

**Learning Expectation**

Learners will be able to use a variety of strategies to solve subtraction problems.

**Essentials for Learning**

Learners can solve subtraction sentences within 100.

**New Words**

Decompose, double, component

**Resources**

Number line cards, straws.

Number of Lessons **3****Lesson 1:** Subtraction (using doubles)**Starter**

Play: "10 less". Mention a number and let learners subtract 10 from it. E.g. 1)  $30 \rightarrow 20$   
2)  $15 \rightarrow 5$  3)  $37 \rightarrow 27$  4)  $100 \rightarrow 90$

**Find Out**

Refer learners to 'Find Out' on page 115 of the Learner's Book. Learners look at the pictures and talk about it. Ask questions for learners to know that the legs of the animals are in doubles. The goat has four legs  $\rightarrow$  double of 2 is 4. The spider has 8 legs  $\rightarrow$  double of 4 is 8.

**Let Us Learn**

- Have learners work in pairs. They face each other and look at each other. Learners mention parts of the body which are in pairs. E.g. eyes, legs, feet, fingers, toes etc. Learners mention other objects which have doubles. E.g. cars, table, etc. (**Critical thinking, collaborative learning**).
- Learners work in groups of five. Write this sentence on the board.  
 $22 - 11 = ?$  Now they can easily make doubles from 22, as  $11 + 11 = 22$ . Learners can easily do the subtraction now.  
 $22 - 11 \rightarrow 11 + 11 - 11 = 11$

- Write these for learners to work in groups of four. 1)  $48 - 24 = ?$  2)  $30 - 15 = ?$   
(**Critical thinking, collaborative learning, attention to precision**)
- Refer learners to **Let us Learn: 1** on page 115 of the Learner's Book. Go through the exercises with learners.

**Review Exercise**

Ask: How do we make doubles to do subtraction?

**Differentiated lessons**

Use doubles to subtract. Work in pairs.

**Low Ability Learners**

1)  $20 - 10 = ?$  2)  $24 - 12 = ?$

**High Ability Learners**

1)  $66 - 33 = ?$  2)  $88 - 44 = ?$

**Assessment for Learning**

Refer learners to Exercise 1 on page 117 of the Learner's Book.

**Suggested Home Work**

Use doubles to subtract.

1)  $24 - 12 = ?$  2)  $30 - 15 = ?$   
3)  $26 - 13 = ?$  4)  $70 - 35 = ?$

## Lesson 2: Subtraction (using decomposition)

### Starter

Play: "10 less". Mention a number and let learners subtract 10 from it. E.g. 1)  $30 \rightarrow 20$   
2)  $15 \rightarrow 5$  3)  $37 \rightarrow 27$  4)  $120 \rightarrow 110$

### Let Us Learn

- Put learners into groups of five. Write this sentence on the board for learners to solve.  $24 - 15 = ?$   
Learners find doubles which will make 24 and that is  $12 + 12$ . Learners now decompose 15 as  $12 + 3$ . The subtraction sentence now reads.  $(12 + 12) - (12 + 3)$   
 $12 + 12 - 12 = 12$   
 $12 - 3 = 9$  so  $24 - 15 = 9$
- Write these sentences for learners to work in pairs. 1)  $36 - 21 = ?$  2)  $44 - 25 = ?$
- Refer learners to **Let us learn: 2** on page 116 of the Learner's Book. Take learners through the exercises.

### Review Exercise

#### Differentiated lessons

Work in pairs. Use doubles to solve these subtraction sentences.

#### Low Ability Learners

1)  $22 - 14 = ?$  2)  $26 - 15 = ?$

#### High Ability Learners

1)  $88 - 46 = ?$  2)  $64 - 37 = ?$

#### Assessment for Learning

Refer learners to Exercise 2 on pages 117 and 118 of the Learner's Book.

#### Suggested Home Work

Solve these subtraction sentences.

1)  $40 - 23 = ?$  2)  $32 - 19 = ?$   
3)  $70 - 38 = ?$  4)  $50 - 25 = ?$

## Lesson 3: Subtraction (using compensation strategy)

### Starter

Play: "10 less". Mention a number and let learners subtract 10 from it.

E.g. 1)  $30 \rightarrow 20$   
3)  $37 \rightarrow 27$

2)  $15 \rightarrow 5$   
4)  $200 \rightarrow 190$

### Let Us Learn

- Learners work in groups of five to solve  $50 - 25 = ?$  Let learners come to the board to explain the strategies used in solving the problem.
- Now explain step by step how they can use the doubles and the compensation strategies to solve  $80 - 39 = ?$
- Have learners make doubles for  $80 = 40 + 40$   
 $40 + 40 - 39 = ?$   
 $40 + 40 - 39 = ?$  Compensate 39 with 1 to make 40.  
So,  $80 - 39$  now reads  $40 + 40 - 40 = 40 + 1 = 41$ . (We have to add 1 more to the answer because we subtracted 1 more than was expected). So  $80 - 39 = 41$ .
- Have learners solve  $60 - 32 = ?$  in their groups. (**critical thinking, problem solving skills, collaborative learning**)
- Refer learners to **Let us learn: 3** on page 116 of the Learner's Book. Go through the exercise with learners.

### Review Exercise

Ask learners: How do you use doubles and compensation strategy to solve subtraction sentence?

#### Differentiated lessons

Solve these subtraction sentences using compensation strategy.

#### Low Ability Learners

1)  $40 - 18 = ?$  2)  $60 - 27 = ?$

#### High Ability Learners

1)  $100 - 58 = ?$  2)  $120 - 67 = ?$

#### Assessment for Learning

Refer learners to Exercise 3 on page 118 of the Learner's Book.

#### Suggested Home Work

Solve these subtraction sentences use doubles and compensation strategies.

1)  $80 - 39 = ?$  2)  $62 - 18 = ?$   
3)  $38 - 17 = ?$  4)  $100 - 48 = ?$

For additional exercises on this module, refer to pages 82 - 86 of the Workbook

## Module 9: Subtraction strategies (2)

## Content Standard

**B3.1.2.3:** Develop and use strategies for mentally computing basic addition and subtraction facts within 100

## Indicator

**B3.1.2.3.2:** Use strategies to mentally add and subtract whole numbers within 100

## Learning Expectation

Learners will be able to use friendly jumps and compensation strategies to solve subtraction problems.

## Essentials for Learning

Learners can use doubles and decomposition strategies to solve subtraction problems.

## New Words

Counting up, friendly jumps, compensate, subtract.

## Resources

Number line cards, subtraction sentence cards.

Number of Lessons **2**

## Lesson 1: Subtraction using compensation

## Starter

Play; "Making 10s". Call out a number and learners top up the number to make 10. E.g.

- 1)  $1 \rightarrow 9$       2)  $9 \rightarrow 1$   
3)  $0 \rightarrow 10$      4)  $10 \rightarrow 0$

## Find Out

Learners work in pairs. Refer learners to "Find Out" on page 119 of the Learner's Book. Learners work and explain how they got their answers and the strategies they used. Accept any strategy used if the answer is correct.

## Let Us Learn

- Put learners into groups of five. Give out subtraction sentence cards to learners in their groups.

$$49 - 28 = ?$$

- Explain to learners that it is easier to subtract if the subtrahend is in multiples of 10s. They should come out with the number which when added to 28 will make it a multiple of 10, that is 2. So, the subtraction sentence now reads:  
 $49 - 30$  (add 2)  
 $49 - 30 = 19$   
 19 (add 2 more because we subtracted 2 more than was expected)  
 So  $49 - 28 = 21$

- Have learners work in pairs and solve these.  
 1)  $77 - 39 = ?$                       2)  $69 - 27 = ?$
- Refer learners to **Let us Learn: 1** on page 119 of the Learner's Book. Go through the questions with learners. Invite a group to solve the question on the board. (*critical thinking, collaborative learning, leadership skills, attention to precision*).

## Review Exercise

## Differentiated lessons

Use compensation strategy to solve these subtraction sentences.

## Low Ability Learners

- 1)  $36 - 19 = ?$                       2)  $58 - 39 = ?$

## High Ability Learners

- 1)  $88 - 48 = ?$                       2)  $98 - 67 = ?$

## Assessment for Learning

Refer learners to Exercise 1 on page 123 of the Learner's Book.

## Suggested Home Work

Solve these subtraction sentences. Use compensation strategy.

- 1)  $68 - 29 = ?$                       2)  $57 - 38 = ?$   
3)  $96 - 48 = ?$                       4)  $88 - 67 = ?$



## Lesson 2: Subtraction (using friendly jumps)

### Starter

Play: "10 less". Mention a number and let learners subtract 10 from it. E.g. 1)  $30 \rightarrow 20$   
2)  $15 \rightarrow 5$  3)  $37 \rightarrow 27$

### Let Us Learn

- Put learners into groups of five. Give them this subtraction sentence to solve.

$$62 - 35 = ?$$

- Allow them to use any strategy. Let them compare their answers to the other groups and discuss the strategy they used.

**(critical thinking, collaborative learning, problem solving skills)**

- Method 1:  $62 - 35 = ?$ , change to an addition sentence  $35 + \square = 62$ . Learners explain the meaning of the addition sentence as  $35 + \text{what} = 62$ . Let learners understand that we are going to add up from 35 till we get to 62. Then the answer will be the sum of what we added.

so  $35 + \square = 62$

Add 5 to 35 to get 40

Add 10 to 40 to get 50

Add 10 to 50 to get 60

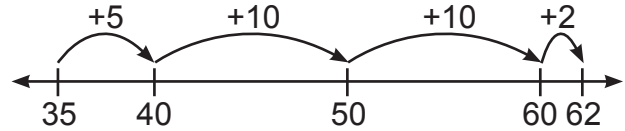
Add 2 to 60 to get 62

Let learners write the sum of what were

added. That is  $5 + 10 + 10 + 2 = 27$

so  $62 - 35 = 27$

- Method 2:  $62 - 35 = ?$ , change to an addition sentence  $35 + \square = 62$ . Have learners use the number line and count the number of jumps. They add the number of jumps to get the answer.



$$5 + 10 + 10 + 2 = 27.$$

$$\text{So } 62 - 35 = 27$$

- Refer learners to **Let us learn: 2** on pages 120 to 123 of the Learner's Book. Go through the exercise with them.

### Review Exercise

#### Differentiated Lessons

Solve these subtraction sentences using friendly jumps.

#### Low Ability Learners

1)  $32 - 18 = ?$  2)  $58 - 39 = ?$

#### High Ability Learners

1)  $82 - 45 = ?$  2)  $77 - 48 = ?$

#### Assessment for Learning

Refer learners to Exercise 2 on page 123 of the Learner's Book.

#### Suggested Home Work

Use friendly jumps strategy to solve these subtraction sentences.

1)  $55 - 36 = ?$  2)  $68 - 39 = ?$

3)  $86 - 47 = ?$  4)  $82 - 46 = ?$

For additional exercises on this module, refer to pages 87 - 90 of the Workbook

**Module 10:** Addition of two 2-digit and three 3-digit numbers**Content Standard**

**B3.1.2.4:** Develop and apply personal and standard strategies for adding and subtracting within 1000

**Indicator**

**B3.1.2.4.1:** Use a variety of personal strategies for adding within 1000

**Learning Expectation**

Learners will be able to add two 2-digit and two 3-digit numbers.

**Essentials for Learning**

Learners can solve addition with sum up to 100.

**New Words**

Multi-base block, decompose.

**Resources**

Multi-base block, straws, abacus.

Number of Lessons **2****Lesson 1:** Addition of two 2-digit numbers**Starter**

Play; "10 more". Mention a number and let learners add another number to make 10.

E.g. 1)  $6 \rightarrow 4$                       2)  $4 \rightarrow 6$   
       3)  $7 \rightarrow 3$                       4)  $2 \rightarrow 8$

**Find Out**

Refer learners to page 124 of the Learner's Book. Have learners work in pairs to solve the problem.  $52 + 17 = ?$  Elicit from them on how they solved it and the strategy used (**critical thinking, collaborative learning, problems solving skills**).

**Let Us Learn**

- Introduce the multi-base block to learners. The flat = 100, the rod = 10 and the cube = 1.
- Write  $45 + 32 = ?$  on the board:  
In their groups give them multi-base block to model the question and find the answer.
- In pairs have learners solve  $63 + 28 = ?$  (**critical thinking, collaborative learning, attention to precision**)
- Refer learners to **Let us learn: 1** on pages 124 to 125 of the Learner's Book. Go through the 2 questions with learners:  $47 + 38 = ?$  and  $226 + 57 = ?$  Learners model the questions and solve them.

Start adding the tens first before adding the ones.

**Ask:** What do you do when the cubes are more than 10?

**Expected answer:** You replace 10 cubes with 1 rod.

**Review Exercise****Differentiated lessons**

Solve these addition sentences.

**Low Ability Learners**

1)  $26 + 33 = ?$                       2)  $44 + 35 = ?$

**High Ability Learners**

1)  $62 + 37 = ?$                       2)  $48 + 27 = ?$

**Assessment for Learning**

Refer learners to Learner's Book page 127 for exercise.

**Suggested Home Work**

Solve these addition sentences.

1)  $47 + 22 = ?$                       2)  $58 + 31 = ?$   
       3)  $26 + 37 = ?$                       4)  $36 + 48 = ?$

## Lesson 2: Addition of two 3-digit numbers

## Starter

Play; “10 more”. Mention a number for learners to add another number to make 10.

E.g. 1)  $6 \rightarrow 4$       2)  $4 \rightarrow 6$   
3)  $7 \rightarrow 3$       4)  $2 \rightarrow 8$

## Let Us Learn

- Put learners into groups of five. Give them the multi-base blocks to solve  $45 + 39 = ?$  Learners exchange their work and make corrections where necessary. Now introduce the block as 1000 to learners. Write these sentences on the board for learners to solve.  $324 + 46 = ?$  Now learners model the question with the multi-based blocks and solve it (**critical thinking, collaborative learning, attention to precision**).
- Write these on the board for learners to work in pairs. 1)  $452 + 346 = ?$   
2)  $602 + 127 = ?$
- Refer learners to **Let us learn: 2** on page 126 of the Learner's Book. Go through the question with learners. Let them model  $364 + 278$  first. Learners can add from left to right or vice-versa (**critical thinking, collaboration learning, attention to precision**)

## Review Exercise

Solve these addition problems.

## Differentiated Lessons

## Low Ability Learners

1)  $222 + 46 = ?$

2)  $534 + 44 = ?$

## High Ability Learners

1)  $548 + 361 = ?$

2)  $246 + 592 = ?$

## Assessment for Learning

Refer learners to Exercise 2 on pages 128 to 129 of the Learners Book.

## Suggested Home Work

Solve these addition sentences.

1)  $67 + 92 = ?$

2)  $136 + 345 = ?$

3)  $278 + 541 = ?$

4)  $328 + 437 = ?$

For additional exercises on this module, refer to pages 91 - 96 of the Workbook.

**Module 11:** Subtraction of 2 - and 3-digit numbers**Content Standard**

**B3.1.2.4:** Develop and apply personal and standard strategies for adding and subtracting within 1000.

**Indicator**

**B3.1.2.4.2:** Use a variety of personal and standard strategies to solve different types of subtraction and addition equations and problems with missing numbers in all positions.

**Learning Expectations**

Learners will be able to solve different types of subtraction using different strategies.

**Essentials for Learning**

Learners can do addition of two 3-digit numbers.

**New Words**

Base ten block, abacus, subtract.

**Resources**

Multi-base block, abacus, straws.

Number of Lessons **2****Lesson 1:** Subtraction of two 2-digit numbers**Starter**

Play; "10 less". Call out a number for learners to subtract 10 from it. E.g. 1)  $12 \rightarrow 2$   
2)  $20 \rightarrow 10$     3)  $16 \rightarrow 6$

**Find Out**

Refer learners to **Find out** on page 130 of the Learner's Book. Learners work in pairs to solve  $53 - 7 = ?$  Learners come out with the strategy used.

**Let Us Learn**

- Write a subtraction sentence on the board. E.g.  $66 - 24 = ?$  Ask learners to model 66 and subtract 24 from it by removing 2 rods and 4 cubes. They count the remaining blocks and write the answer. Repeat this with different numbers. Have learners work in pairs. (**Critical thinking, collaborative learning, attention to precision**)
- Learners use the Hundred frame to solve these 1)  $65 - 24 = ?$     2)  $86 - 38 = ?$

H	T	O
	8	6
-	3	8
	4	8

- Take 1 ten from 8 tens, break it into ones as 10 ones. Add to 6 ones to get 16, subtract 8 from 16 to get 8. Now you are left with 7 tens, take away 3 tens and you will be left with 4 tens and 8 ones.  
So  $86 - 38 = 48$ .
- Refer learners to **Let us learn: 1** on pages 130 to 132 of the Learner's Book. Go through the 3 questions with learners using the 100 frame and the multi-base block.

**Review Exercise**

Work these using the Hundred frame or the multi-base block.

**Differentiated Lessons****Low Ability Learners**

- 1)  $74 - 31 = ?$     2)  $54 - 28 = ?$

**High Ability Learners**

- 1)  $62 - 36 = ?$     2)  $134 - 42 = ?$

**Assessment for Learning**

Refer learners to Exercise 1 on page 134 of the Learner's Book.

**Suggested Home Work**

Solve these subtraction questions.

- 1)  $72 - 31 = ?$     2)  $65 - 28 = ?$   
3)  $92 - 65 = ?$     4)  $342 - 53 = ?$

## Lesson 2: Subtraction of two 3-digit numbers.

### Starter

Play; "10 less". Call out a number and let learners subtract 10 from it and call out the number. E.g. 1)  $12 \rightarrow 2$  2)  $20 \rightarrow 10$   
3)  $16 \rightarrow 6$  4)  $30 \rightarrow 20$

### Let Us Learn

- Put learners into groups of five. Write  $62 - 26 = ?$  on the board for learners to solve. They compare their answers with the other groups.
- Write  $472 - 246$  on the board. Have learners use the base ten block and Hundred frame to solve it.

H	T	O
4	7(6)	2(12)
- 2	4	6
2	2	6

So  $472 - 246 = 226$

- Working in pairs, have learners solve  $542 - 361 = ?$  (**Critical thinking, collaborative learning, attention to precision**)

- Refer learners to **Let us learn: 2** on pages 132 to 133 of the Learner's Book. Go through the 2 questions with learners using the frame and the multi-base block.

### Review Exercise

Use the hundred frame to solve these subtraction sentences.

### Differentiated Lessons

#### Low Ability Learners

- 1)  $62 - 46 = ?$  2)  $348 - 152 = ?$

#### High Ability Learners

- 1)  $680 - 269 = ?$  2)  $724 - 532 = ?$

### Assessment for Learning

Refer learners to Exercise 2 on page 134 of the Learner's Book.

### Suggested Home Work

Solve these subtraction sentences using the Hundred frame.

- 1)  $92 - 65 = ?$  2)  $436 - 142 = ?$   
3)  $781 - 592 = ?$  4)  $885 - 728 = ?$

For additional exercises on this module, refer to pages 97 - 100 of the Workbook

**Module 12:** Addition of whole numbers (1)**Content Standard**

**B3.1.2.4:** Develop and apply personal and standard strategies for adding and subtracting within 1000.

**Indicator**

**B3.1.2.4.2:** Use a variety of personal and standard strategies to solve different types of subtraction and addition equations and problems with missing numbers in all positions.

**Learning Expectations**

Learners will be able to solve different

types of addition problems using different strategies.

**Essentials for Learning**

Learners can solve addition problems with sum up to 100.

**New Words**

Partial sum, splitting, friendly jumps, hundreds, tens.

**Resources**

Number line cards.

Number of Lessons **3**

**Lesson 1:** Adding two 2-digit numbers**Starter**

Play; "Making 10s". Mention a number for learners to add up to make 10.  
E.g. 1)  $6 \rightarrow 4$  2)  $8 \rightarrow 2$  3)  $10 \rightarrow 0$  4)  $9 \rightarrow 1$

**Find Out**

Refer learners to page 135 of the Learner's Book. Learners work in pairs. Let them find the missing numbers in the question.

Ask: What must be added to 35 to get 80?  
That is  $35 + ? = 80$ . Learners solve and explain the strategy used with other group members.

**Let Us Learn**

- Put learners into groups of six. Write this sentence on the board.

$35 + 28 = ?$  Ask learners to use splitting or partial sum to solve it.

$$\begin{array}{r} 35 \quad + \quad 28 \\ \downarrow \quad \downarrow \\ 30 \quad + \quad 20 \quad + \quad 5 \quad + \quad 8 \\ 30 + 20 + 5 + 8 \\ 50 + 5 + 5 + 3 \\ 50 + 10 + 3 \\ 60 + 3 = 63 \\ \text{so } 35 + 28 = 63 \end{array}$$

- In pairs have learners use the same strategy to solve these addition sentences.

1)  $26 + 55 = ?$                       2)  $42 + 38 = ?$

*(critical thinking, collaborative learning, attention to precision)*

Write  $45 + 27 = ?$  Split/decompose the two numbers and add.

$$\begin{array}{r} 45 \quad + \quad 27 \\ \downarrow \quad \downarrow \\ 40 \quad + \quad 20 \quad + \quad 5 \quad + \quad 7 \\ 40 + 20 + 5 + 7 \\ 60 + 5 + 5 + 2 \\ 60 + 10 + 2 = 72 \end{array}$$

- Refer learners to **Let us learn: 1** on pages 135 to 136 of the Learner's Book. Go through the example with learners.

**Review Exercise**

Use splitting or decomposing strategy to solve these addition sentences.

**Differentiated Lessons****Low Ability Learners**

1)  $25 + 32 = ?$     2)  $16 + 53 = ?$

**High Ability Learners**

1)  $52 + 46 = ?$                       2)  $38 + 37 = ?$

**Assessment for Learning**

Refer learners to Learner's Book page 138 for exercise.

**Suggested Home Work**

Use splitting/decomposing strategies to solve these.

1)  $48 + 53 = ?$                       2)  $72 + 19 = ?$   
3)  $39 + 46 = ?$                       4)  $55 + 45 = ?$



## Lesson 2: Adding 2-digit to 3-digit numbers

### Starter

Play;" Making 10s". Mention a number, learners add up to make 10. E.g. 1)  $6 \rightarrow 4$   
2)  $8 \rightarrow 2$  3)  $7 \rightarrow 3$  4)  $0 \rightarrow 10$

### Let Us Learn

- Put learners into groups of five. Work these examples with learners, explain step by step.  $164 + 42 = ?$   
Split/decompose 164 and 42  
 $164 = 100 + 60 + 4$ ,  $42 = 40 + 2$   
 $100 + 40 + 60 + 4 + 2$   
 $= 100 + 100 + 6$  (add 10s and 1s)  
 $= 200 + 6$  (add 100s and 1s)  
 $= 206$   
So  $164 + 42 = 206$
- Write these for learners to work in groups of five. 1)  $264 + 46 = ?$  2)  $368 + 35 = ?$   
(**critical thinking, collaboration learning, attention to precision**)
- Refer learners to **Let us learn: 2** on page 136 of the Learner's Book. Go through the question  $268 + 42 = ?$  with learners.

### Review Exercise

Use splitting or decomposition strategy to solve these.

### Differentiated Lessons

#### Low ability Learners

- 1)  $224 + 34 = ?$  2)  $432 + 38 = ?$

#### High Ability Learners

- 1)  $428 + 64 = ?$  2)  $577 + 76 = ?$

### Assessment for Learning

Refer learners to Learner's Book page 139 for exercise.

### Suggested Home Work

Use splitting /decomposing strategy to solve these addition sentences.

- 1)  $136 + 33 = ?$  2)  $248 + 55 = ?$   
3)  $472 + 88 = ?$  4)  $606 + 58 = ?$

## Lesson 3: Adding two 3-digit numbers

### Starter

Play;" Making 10s". Mention a number, learners top up that number to make 10. E.g. 1)  $0 \rightarrow 10$  2)  $8 \rightarrow 2$  3)  $5 \rightarrow 5$  4)  $1 \rightarrow 9$

### Let Us Learn

- Write  $224 + 163$  on the board. Have learners split/decompose the two numbers as follows:  
 $224 = 200 + 20 + 4$   
 $163 = 100 + 60 + 3$   
So,  $200 + 100 + 20 + 60 + 4 + 3$   
(group 100s, 10s and 1s together and add)  
 $200 + 100 + 20 + 60 + 4 + 3$   
 $300 + 80 + 7 = 387$   
So,  $224 + 163 = 387$
- Working in pairs have learners solve these addition sentences. 1)  $364 + 23$  2)  $408 + 235$  (**critical thinking, collaborative learning attention to precision**)
- Refer learners to **Let us learn: 3** on page 137 of the Learner's Book. Go through the examples with them.

### Review Exercise

Use splitting/decomposing strategy to solve these addition sentences.

### Differentiated Lessons

#### Low Ability Learners

- 1)  $242 + 322 = ?$  2)  $406 + 326 = ?$

#### High Ability Learners

- 1)  $438 + 582 = ?$  2)  $328 + 584 = ?$

### Assessment for Learning

Refer learners to Learner's Book page 139 for exercise.

### Suggested Home Work

Solve these

- 1)  $223 + 325 = ?$  2)  $548 + 126 = ?$   
3)  $456 + 366 = ?$  4)  $702 + 416 = ?$

For additional exercises on this module, refer to pages 101 - 103 of the Workbook

**Module 13:** Addition of whole numbers (2)**Content Standard**

**B3.1.2.4:** Develop and apply personal and standard strategies for adding and subtracting within 1000.

**Indicator**

**B3.1.2.4.2:** Use a variety of personal and standard strategies to solve different types of subtraction and addition equations and problems with missing numbers in all positions.

**Learning Expectations**

Learners will be able to use compensation strategy to solve addition problems of whole numbers with sum up to 1000.

**Essentials for Learning**

Learners can solve addition problems using decomposition and friendly jump strategies.

**New Words**

Compensate, making 10s and 100s.

**Resources**

Number line cards.

Number of Lessons **2**

## Lesson 1: Addition of whole numbers (using "making 10s and 100s")

**Starter**

Play; "Making 10s". Call out a number and learners add up to make 10. E.g.

1)  $1 \rightarrow 9$     2)  $6 \rightarrow 4$     3)  $3 \rightarrow 7$     4)  $0 \rightarrow 10$

**Find Out**

Refer learners to Learner's Book page 140. Have learners work in pairs. They study the patterns carefully and come out with the rules for movement upwards and downwards and movement from right to left and vice-versa.

**Note:** learners know this movement already.

**Let Us Learn**

- Have learners work in groups of five. Play: "Making multiples of 10" with learners. Mention a number and learners add another number to make the number a multiple of 10.

1)  $57 \rightarrow 60$                       2)  $69 \rightarrow 70$

3)  $78 \rightarrow 80$                       4)  $99 \rightarrow 100$

5)  $198 \rightarrow 200$  (**critical thinking, collaborative learning, attention to precision**)

Write these addition sentences on the board. 1)  $45 + 48 = ?$     2)  $457 + 38 = ?$   
Ask learners which of the two numbers is easier to make it a multiple of 10. For question 1, move 2 from 45 and add to 48 to get 50. The question now reads

$43 + 50 = ?$                       Break 50 into 10s and add.  $43 + 10 + 10 + 10 + 10 + 10 = 93$  or  $43 + 20 + 20 + 10 = 93$  (**critical thinking, collaborative learning, problems solving skills**)

The number line also could be used.

- Have learners work in pairs to solve these sentences.  
1)  $36 + 25 = ?$                       2)  $65 + 26 = ?$
- Add  $497 + 326 = ?$  Ask learners the easier number to be made a multiple of 100, ie 497. Move 3 from 326 and add it to 497 to get 500. The question now reads  $500 + 323$ . Break 323 as  $300 + 20 + 3 \rightarrow 500 + 300 + 20 + 3 = 800 + 20 + 3 = 823$ .
- Refer learners to **Let us learn: 1** on pages 140 and 141 of the Learner's Book. Go through the two exercises with learners.

**Review Exercise**

Use compensation strategy to solve these addition questions.

**Differentiated Lessons****Low Ability Learners**

1)  $68 + 35 = ?$                       2)  $28 + 38 = ?$

**High Ability Learners**

1)  $43 + 58 = ?$                       2)  $236 + 198 = ?$

**Assessment for Learning**

Refer learners to Exercise 1 on pages 142 and 143 of the Learner's Book.

**Suggested Home Work**

Use compensation strategy to solve these

- 1)  $42 + 38 = ?$       2)  $58 + 47 = ?$   
 3)  $327 + 285 = ?$       4)  $467 + 294 = ?$

## Lesson 2: Addition of whole numbers (using compensation strategy)

**Starter**

Play; "Making 10s". Mention a number, learners add up to make 10. E.g. 1)  $1 \rightarrow 9$   
 2)  $6 \rightarrow 4$     3)  $0 \rightarrow 10$     4)  $1 \rightarrow 9$

**Let Us Learn**

- Write this sentence on the board  $246 + 39 = ?$ . Learners brainstorm how to get the answer. Discuss with learners how they got the answer.
- Ask learners the number which is nearer to a multiple of 10. That is 39. Learners add 1 to 39, to get 40. The sentence now reads  $246 + 40 = 286$ . To get the answer correct, we have to subtract 1 from the answer because we added 1 more than was expected, so  $286 - 1 = 285$ . So  $246 + 39 = 285$
- Second method:**  $246 + 39 = ?$  We move 1 from 246 and add to 39 to get 40. The sentence now reads  $245 + 40 = 285$ . Have learners work this in pairs  $326 + 47 = ?$  (**problems solving skills, critical thinking, collaborative learning**)
- Write this sentence on the board.  $346 + 299 = ?$  (adding 3-digit numbers to another 3-digit numbers).
- Using same strategy, have learners solve  $346 + 299 = ?$ . Learners move 1 from 346 and add to 299 to get 300. The question now reads  $345 + 300 = ?$   
 So  $345 + 300 = 645$ . (**critical thinking, collaborative learning, problems solving skills**)

- Refer learners to **Let us Learn: 2** on pages 141 to 142 of the Learner's Book. Go through questions 1 a, 1 b and 2 with learners.
- Note:** *Compensation strategy work best when one of the numbers could be made a multiple of 10 easily.*

**Review Exercise**

**Ask learners:** How do you use compensation strategy to solve addition problems? Discuss in pairs.

**Differentiated Lessons**

Use compensation strategy to solve these addition sentences.

**Low Ability Learners**

- 1)  $144 + 29 = ?$       2)  $203 + 38 = ?$

**High Ability Learners**

- 1)  $433 + 197 = ?$       2)  $255 + 293 = ?$

**Assessment for Learning**

Refer learners to Exercise 2 on page 143 of the Learner's Book.

**Suggested Home Work**

Solve these addition sentences. Use compensation strategy.

- 1)  $299 + 361 = ?$       2)  $638 + 28 = ?$   
 3)  $734 + 291 = ?$       4)  $525 + 293 = ?$

For additional exercises on this module, refer to pages 104 - 108 of the Workbook

**Module 14:** Subtraction of whole numbers (1)**Content Standard**

**B3.1.2.4:** Develop and apply personal and standard strategies for adding and subtracting within 1000.

**Indicator**

**B3.1.2.4.2:** Use a variety of personal and standard strategies to solve different types of subtraction and addition equations and problems with missing numbers in all positions

**Learning Expectations**

Learners will be able to use different strategies to solve subtraction problems.

**Essentials for Learning**

Learners can use different strategies in solving addition problems.

**New Words**

Counting up, decompose, friendly jumps, count

**Resources**

Number line cards, subtraction sentence cards.

Number of Lessons **2****Lesson 1:** Subtraction of whole numbers (using decomposition strategy)**Starter**

Play; "10 less". Mention or call out a number and learners subtract 10 and call out the number. E.g. 1)  $30 \rightarrow 20$       2)  $65 \rightarrow 55$   
3)  $100 \rightarrow 90$       4)  $77 \rightarrow 67$

**Find Out**

Refer learners to page 144 of the Learner's Book. Have learners work in pairs to solve the question  $459 - 39 = ?$  Learners compare their answers with other groups and discuss the method used.

**Let Us Learn**

- Have learners work in sizeable groups. Write  $264 - 53$  on the board. Learners decompose 53 as  $50 + 3$  and do the subtraction. So the question now reads  $264 - 50 - 3$   
 $214 - 3 = 211$
- Give another question for learners to solve  $438 - 36 = ?$  (**Critical thinking, collaborative learning, attention to precision**)
- Now have learners in pairs solve this  $865 - 354 = ?$  Learners split/decompose 354 as  $300 + 50 + 4$   
 $865 - 300 - 50 - 4$

$$865 - 300 = 565$$

$$565 - 50 = 515$$

$$515 - 4 = 511 \text{ so } 865 - 354 = 511$$

(**Critical thinking, collaborative learning, attention to precision**)

- Refer learners to **Let us learn: 1** on pages 144 and 145 of the Learner's Book. Go through the questions with learners.

**Review Exercise**

In pairs, ask learners to answer the question: How is decomposition strategies used in solving subtraction problems?

**Differentiated Lessons**

Split/decompose the second number and solve these subtraction questions.

**Low Ability Learners**

$$1) 176 - 42 = ? \quad 2) 368 - 143 = ?$$

**High Ability Learners**

$$1) 386 - 242 = ? \quad 2) 568 - 345 = ?$$

**Assessment for Learning**

Refer learners to Learner's Book page 147 for exercise.

**Suggested Home Work**

Solve these subtraction sentences. Use decomposition strategy.

$$1) 436 - 34 = ? \quad 2) 437 - 45 = ?$$

$$3) 668 - 443 = ? \quad 4) 368 - 143 = ?$$

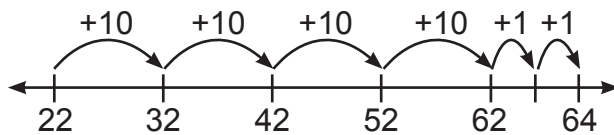
## Lesson 2: Subtraction of whole numbers (using counting up by friendly jumps strategy)

### Starter

Play; "10 less". Mention or call out a number and learners subtract 10 and call out the number. E.g. 1)  $30 \rightarrow 20$  2)  $65 \rightarrow 55$   
3)  $100 \rightarrow 90$  4)  $77 \rightarrow 67$

### Let Us Learn

- Put learners into groups of four. Write this subtraction sentence on the board.  $64 - 22 = ?$  Learners count up/on by 10s starting from 22.



- We add the number of counts/jumps to get the answer.  
 $10 + 10 + 10 + 10 + 1 + 1 = 42$   
so  $64 - 22 = 42$
- Have learners use the same strategy to solve this  $244 - 35 = ?$
- Refer learners to **Let us Learn: 2** on pages 145 to 146 of the Learners Book. Go through question 1 and 2 with learners.

### Review Exercise

#### Differentiated Lessons

Use friendly jumps to solve these subtraction problems.

#### Low Ability Learners

- 1)  $89 - 25 = ?$  2)  $168 - 35 = ?$

#### High Ability Learners

- 1)  $432 - 42 = ?$  2)  $266 - 122 = ?$

### Assessment for Learning

Refer learners to Learner's Book page 148 to 149 for exercise.

### Suggested Home Work

Work these subtraction problems. Use friendly jumps.

- 1)  $567 - 46 = ?$  2)  $325 - 126 = ?$   
3)  $326 - 136 = ?$  4)  $658 - 442 = ?$

For additional exercises on this module, refer to pages 109 - 113 of the Workbook

**Module 15:** Subtraction of whole numbers (2)**Content Standard**

**B3.1.2.4:** Develop and apply personal and standard strategies for adding and subtracting within 1000.

**Indicator**

**B3.1.2.4.2:** Use a variety of personal and standard strategies to solve different types of subtraction and addition equations and problems with missing numbers in all positions

**Learning Expectation**

Learners will be able to solve subtraction sentences with a variety of strategies.

**Essentials for Learning**

Learners can use decomposition and friendly jumps to solve addition and subtraction sentences.

**New Words**

Constant differences, friendlier, compensation.

**Resources**

Number line cards.

Number of Lessons **2****Lesson 1:** Subtraction of whole numbers (using compensation strategy)**Starter**

Play; "2 more". Call out a number and learners add 2 and call out the number. E.g. 1)  $6 \rightarrow 8$   
2)  $10 \rightarrow 12$

**Find Out**

Refer learners to Learner's Book page 150. Have learners work in pairs. Learners discuss how they will solve  $53 - 19 = ?$  and  $158 - 48 = ?$  Which strategy did you use? Learners compare their work with other pairs.

**Let Us Learn**

- Put learners into groups of five. Write this sentence on the board.  $86 - 48 = ?$  To make the subtraction easier add 2 to 48 to make 50.  
The subtraction sentence now reads  $86 - 50 = 36$ . But we have to add 2 to the answer because we subtracted 2 more than was expected.  $86 - 50 = 36 + 2$   
So  $86 - 48 = 38$
- Have learners solve these in pairs.  
1)  $72 - 37 = ?$       2)  $143 - 29 = ?$
- Refer learners to **Let us learn: 1** on page 150 of the Learner's Book. Go through the two exercises with learners using the compensation strategy.  
1)  $185 - 46 = ?$       2)  $525 - 393 = ?$

- Ask learners what must be added to 46 to get a multiple of 10? And what must be added to 393 to get 400. Learners discuss in their groups and solve them.

**Review Exercise****Differentiated Lessons**

Solve these subtraction sentences. Use the compensation strategy.

**Low Ability Learners**

- Work in pairs.      1)  $65 - 28 = ?$   
2)  $86 - 39 = ?$

**High Ability Learners**

- 1)  $365 - 49 = ?$       2)  $255 - 47 = ?$

**Assessment for Learning**

Refer learners to page 152 of the Learner's Book.

**Suggested Home Work**

Use compensation strategy to solve these subtraction sentences.

- 1)  $92 - 48 = ?$       2)  $65 - 39 = ?$   
3)  $465 - 57 = ?$       4)  $472 - 5 = ?$



## Lesson 2: Subtraction of whole numbers (using constant difference strategy)

### Starter

Play; "5 more". Call out a number and learners add 5 and call out the number. E.g. 1)  $5 \rightarrow 10$   
2)  $10 \rightarrow 15$     3)  $4 \rightarrow 9$

### Let Us Learn

- Put learners into groups of five. Write this subtraction sentence on the board.  $65 - 28 = ?$  Explain to learners as follows.  $65 - 28 = ?$  Add 2 to both numbers to get  $\rightarrow 67 - 30 = ?$   
 $67 - 30 = 37$   
so  $65 - 28 = 37$ .
- Write these for learners to work in groups. They compare their answers with other group members.  
1)  $86 - 37 = ?$     2)  $387 - 88 = ?$
- Refer learners to **Let us learn: 2** on page 151 of the Learner's Book. Learners work in pairs to solve the two questions. Go through question 2 with learners using constant difference.  
 $488 - 343 = ?$   
Subtract 3 from each number to get:  
 $485 - 340 = ?$      $485 - 340 = 145$ .  
So  $488 - 343 = 145$

- We can also use the number line to solve it.

### Review Exercise

#### Differentiated Lessons

Solve these subtraction sentences. Use constant difference.

#### Low Ability Learners

- 1)  $74 - 31 = ?$     2)  $64 - 38 = ?$

#### High Ability Learners

- 1)  $333 - 27 = ?$     2)  $265 - 72 = ?$

#### Assessment for Learning

Refer learners to page 153 of the Learner's Book for exercise.

#### Suggested Home Work

Use constant difference strategy to solve these subtraction sentences.

- 1)  $87 - 43 = ?$     2)  $246 - 43 = ?$   
3)  $426 - 38 = ?$     4)  $789 - 428 = ?$

For additional exercises on this module, refer to pages 114 - 116 of the Workbook

**Module 16:** Word problems addition and subtraction**Content Standard**

**B3.1.2.4 :** Develop and apply personal and standard strategies for adding and subtracting within 1000 CONT'D.

**Indicator**

**B3.1.2.4.3:** Develop and explain estimation strategies to estimate the solution for a given word problem involving addition or subtraction sums up to 1000.

**Learning Expectations**

Learners will be able to solve addition and subtraction word problems using estimation strategy.

**Essentials for Learning**

Learners can use compensation strategy to solve addition and subtraction problems.

**New Words**

Estimate, guess, front-end.

**Resources**

Numeral cards.

Number of Lessons **2****Lesson 1:** Addition word problems  
(using estimation  
strategy)**Starter**

Play; "Guess my number". E.g. I am thinking of a number. It is a multiple of 2. It is more than 8 but less than 12. What is the number?

**Find Out**

Refer learners to **Find out: (a)** on page 154 of the Learner's Book. Ask learners to solve the problem in groups. Ask them the answer they got. Let them compare with each other.

**Let us Learn**

- Put learners into groups of five. Write this sentence on the board.  $77 + 26 = ?$ .  
Using the front-end strategy, we maintain the first digit and change the other digits to zero. So  $77 + 26 \rightarrow 70 + 20 = 90$ . So the estimated sum is 90.  
Ask learners to solve  $168 + 258 = ?$  in their groups. Let them use the front-end strategy.  
Refer learners to **Let us learn: 1 (1a and 1b)** on page 154 of the Learner's Book. Go through the questions with them.
- Write this sentence on the board  $230 + 462 = ?$  Using close to 10 or 100 strategy, Round 230 down as 200 and 462 up as 500. So the question now reads  $200 + 500 = 700$ . So the estimated sum is 700.

Explain to learners that if the ones is 5 or more than 5, we round it up to tens. E.g.  
1)  $76 \rightarrow 80$       2)  $55 \rightarrow 60$ . If the ones is less than 5 we round it down to zero. E.g.  
1)  $44 \rightarrow 40$       2)  $33 \rightarrow 30$

Explain to learners that when the number is above 50, we round it up to 100s.

E.g. 1)  $365 \rightarrow 400$       2)  $450 \rightarrow 500$ .

When the number is less than 50, we round it down. E.g. 1)  $338 \rightarrow 300$   
2)  $649 \rightarrow 600$

Refer learners to **Let us learn: 1 (2a and 2b)** on page 155 of the Learner's Book. Go through the questions with them.

- Write this on the board. Musa has 76 bags of maize in his farm. His wife Fati also has 34 bags at home. How many bags of maize has the family altogether.  
To solve this, we write an addition sentence for the word problem as  $76 + 34 = ?$ .  
Round 76 up to 80 and round 34 down to 30. So, the question now reads  $80 + 30 = ?$ . So  $76 + 34 \rightarrow 80 + 30 = 110$ . So the estimated sum is 110.

**Review Exercise****Differentiated Lessons**

Estimate by rounding off the numbers and find the sum.

**Low Ability Learners**

- 1)  $75 + 14 = ?$       2)  $58 + 29 = ?$

**High Ability Learners**

- 1)  $158 + 229 = ?$       2)  $329 + 403 = ?$

**Assessment for Learning**

Refer learners to Learner's Book page 160 for exercise.

**Suggested Home Work**

Use estimated strategy to solve these.

- 1)  $85 + 34 = ?$       2)  $72 + 44 = ?$   
 3)  $528 + 357 = ?$       4)  $266 + 162 = ?$

## Lesson 2: Subtraction word problem (using estimation strategy)

**Starter**

Play; "Guess my number". E.g. I am thinking of a number. It is a multiple of 2. It is more than 8 but less than 12. What is the number?

**Let Us Learn**

- Put learners into groups of five. Write this sentence on the board.  $78 - 26 = ?$ . Using the front-end strategy, we maintain the first digit and change the other digits to zero. So  $78 - 26 \rightarrow 70 - 20 = 50$ . So the estimated difference is 50.
- Write  $560 - 422 = ?$  on the board. Learners discuss in their groups how they will estimate the numbers to solve the questions. Learners round up 560 as 600, and round down 422 as 400. So, the question now reads  $600 - 400 = 200$ .
- Write this word problem on the board. Maame Adwoa has 524 bulbs in her shop. A trader bought 246 of them. How many bulbs has Maame Adwoa now? To solve this, we write a subtraction sentence for the word problem as  $524 - 246 = ?$ . Round 524 down to 520 and 246 down to 240. So, the question now reads  $520 - 240 = ?$ . So  $524 - 246 \rightarrow 520 - 240 = 280$ . So the estimated difference is 280.

- Write these subtraction sentences for learners to solve in pairs.  
 1)  $453 - 236 = ?$       2)  $666 + 439 = ?$
- Refer learners to **Let us learn: 2** on page 157 to 159 of the Learner's Book. Go through exercises with learners. Ask how they could round off the numbers to do the subtraction. Have them work in pairs.

**Review Exercise****Differentiated Lessons**

Round up or down to solve these subtraction sentences.

**Low Ability Learners**

- 1)  $51 - 39 = ?$       2)  $135 - 62 = ?$

**High Ability Learners**

- 1)  $309 - 168 = ?$       2)  $865 - 462 = ?$

**Assessment for Learning**

Refer learners to Learner's Book page 161 for exercise.

**Suggested Home Work**

By rounding up and down, solve these subtraction sentences.

- 1)  $72 - 48 = ?$       2)  $338 - 136 = ?$   
 3)  $569 - 309 = ?$       4)  $896 - 642 = ?$

For additional exercises on this module, refer to pages 117 - 122 of the Workbook.

**Module 17:** Commutative property of addition**Content Standard**

**B3.1.2.4 :** Develop and apply personal and standard strategies for adding and subtracting within 1000 CONT'D.

**Indicator**

**B3.1.2.4.4:** Show an understanding of the property of commutativity.

**Learning Expectations**

Learners will be able to identify that, interchanging the positions of the addends do not change the result.

**Essentials for Learning**

Learners can use different strategies to solve addition problems with sum up to 1000.

**New Words**

Add, change, order, addends, sum.

**Resources**

Numeral cards.

Number of Lessons **1****Lesson 1:** Commutative property of Addition**Starter**

Play;" Making 100s. Call out a number and learners add up another number to make 100.

E.g. 1)  $93 \rightarrow 7$                       2)  $60 \rightarrow 40$   
3)  $80 \rightarrow 20$                       4)  $100 \rightarrow 0$

**Find Out**

Refer learner's to page 162 of the Learner's Book. Have learners work in pairs. Ask learners:

How many birds are in 'a'?

How many birds are in 'b'?

How many birds are in 'c'?

Now, ask learners to compare the sum of 'a' and 'b' to 'd' and 'e' and discuss their findings, and draw conclusion:  $15 + 20 = 35 = 20 + 15 = 35$ .

**Let us Learn**

- Have learners work in pairs and solve these addition sentences.  
 $20 + 15 = ?$                        $15 + 20 = ?$   
 $20 + 15 = 35$                        $15 + 20 = 35$ . The answer does not change when the numbers are interchanged.
- Write these for learners to solve in class. They compare their answers and correct themselves where necessary.  
1)  $20 + 30 = ?$                       2)  $36 + 29 = ?$   
3)  $30 + 20 = ?$                       4)  $29 + 36 = ?$
- In pairs, have learners write their own addition sentences and solve them. They interchange the addends and solve them. They compare their answers and draw conclusion that when addend positions are

changed, the result is the same.

- Refer learners to Learner's Book page 163. Go through **Let us learn** and **Let us practice** with learners.

1)  $26 + 14, 14 + 26 = \boxed{\phantom{00}}$

2)  $425 + 353, 353 + 425 = \boxed{\phantom{000}}$

**Review Exercise**

Solve these addition questions. Draw your conclusions.

**Differentiated Lessons****Low Ability Learners**

1)  $25 + 30 = \boxed{\phantom{00}}$                        $30 + 25 = \boxed{\phantom{00}}$

2)  $65 + 15 = \boxed{\phantom{00}}$                        $15 + 65 = \boxed{\phantom{00}}$

**High Ability Learners**

- Write two addition sentences on your own. Change the positions of the addends and solve them. What do you notice?

**Assessment for Learning**

Refer learners to Learner's Book page 164 for exercise.

**Suggested Home Work**

Work these addition sentences.

What do you say?

1)  $40 + 35 = \boxed{\phantom{00}}$                        $35 + 40 = \boxed{\phantom{00}}$

2)  $73 + 24 = \boxed{\phantom{00}}$                        $24 + 73 = \boxed{\phantom{00}}$

3)  $200 + 154 = \boxed{\phantom{000}}$                        $154 + 200 = \boxed{\phantom{000}}$

4)  $250 + 140 = \boxed{\phantom{000}}$                        $140 + 250 = \boxed{\phantom{000}}$

For additional exercises on this module, refer to pages 123 - 125 of the Workbook.

## Module 18: Multiplication (1)

**Content Standard**

**B3.1.2.5:** Demonstrate an understanding of multiplication up to  $5 \times 5$

**Indicator**

**B3.1.2.5.1:** Represent and explain multiplication using equal groupings

**Learning Expectations**

Learners will be able to solve multiplication problems using equal groupings.

**Essentials for Learning**

Learners can group objects-based on a given criteria.

**New Words**

Multiplication, equal groupings, groups, multiplies.

**Resources**

Bottle caps, seeds, pebbles.

Number of Lessons 1

**Lesson:1** Multiplication using equal groupings**Starter**

Play; "Making Doubles". Call out a number and learners double it and call out the number.

E.g. 1)  $2 \rightarrow 4$                       2)  $10 \rightarrow 20$   
       3)  $30 \rightarrow 60$                     4)  $100 \rightarrow 200$

**Find Out**

Refer learners to page 165 of the Learner's Book. Have learners work in pairs. They discuss among themselves how they got the answer to the repeated addition.

**Let Us Learn**

- Put learners into groups of five. Give them 12 bottle caps. Have learners make equal groupings of the twelve caps.  
 e.g. 2 groups of 6  $\rightarrow 2 \times 6 = 12$   
       3 groups of 4  $\rightarrow 3 \times 4 = 12$   
       4 groups of 3  $\rightarrow 4 \times 3 = 12$   
       1 group of 12  $\rightarrow 1 \times 12 = 12$   
       12 groups of 1  $\rightarrow 12 \times 1 = 12$
- Learners go round and discuss among other group members the number of times they made the equal groupings.
- Give them 10 bottle caps and ask learners to put them into different equal groupings. They compare with other group members and find out the number of equal groupings they made. (**Critical thinking, Collaborative learning, Problem solving skills**)
- Refer learners to **Let us learn** on pages 165 to 166 of the Learner's Book. Go

through the exercises with learners.

Learners tell you the number of groupings and the number of balls in each group.

- Introduce the multiplication sign ( $\times$ ) and tell them that instead of counting and adding, we can just multiply the number of groupings by the number of objects in the group.  
 So the 4 groups of 3 balls reads  $4 \times 3 = 12$ .
- Learners write the multiplication sentences for questions 2 – 6.
- Go through **Let us practice** on page 166 of the Learner's Book with learners.

**Review Exercise**

Learners work with partners.

**Differentiated Lessons****Low Ability Learners**

- Give out 16 bottle caps to learners to make 5 different equal groupings.

**High Ability Learners**

- Give out 24 bottle caps to them. They make 8 different groupings.

**Assessment for Learning**

Refer learners to Learner's Book page 167 to 169 for exercise.

**Suggested Home Work**

Use 16 triangles to make 5 equal groupings. Write the multiplication sentences and solve them.

For additional exercises on this module, refer to pages 126 - 129 of the Workbook.

## Module 19: Multiplication (2)

## Content Standard

**B3.1.2.5:** Demonstrate an understanding of multiplication up to  $5 \times 5$  CONT'D.

## Indicator

**B3.1.2.5.2:** Represent and explain multiplication using rectangular arrays.

## Learning Expectations

Learners will be able to arrange objects in rows and columns, write a multiplication sentence and solve it.

## Essentials for Learning

Learners can make equal groupings of a given number of objects.

## New Words

Arrays, dots, across, vertical, horizontal, intersection, rows, columns.

## Resources

Multiplication sentence cards, straws, bottle caps.

Number of Lessons **2**

## Lesson 1: Multiplication (using arrays of dots)

## Starter

Play; "Making Doubles". Call out a number and learners double it and call out the number.

E.g. 1)  $2 \rightarrow 4$       2)  $10 \rightarrow 20$   
3)  $30 \rightarrow 60$       4)  $100 \rightarrow 200$

## Find Out

Refer learners to Learner's Book page 170. Whole Class Lesson. Ask learners the following questions.

How many legs has 1 cow?

How many legs have 2 cows?

How many legs have 3 cows?

## Let Us Learn

- Use the sitting arrangement in the classroom to teach rows and columns.
- Call the first-row learners to stand up. Second, third, etc.
- Now, call out learners in the columns to do the same. Learners write the multiplication sentences for the number of learners in the class. E.g. 10 rows x 6 columns (*critical thinking, collaborative learning, attention to precision*).
- Have learners work in groups of six. Give out 20 bottle caps to each group to arrange them into rows of 5 bottle caps. Learners identify the number of rows and columns and write the multiplication sentence for it as  $4 \times 5 = ?$



- Learners discuss among themselves and identify that a row is the same as "horizontal" and a column is the same as "vertical". Have learners model these sentences with bottle caps.  
1)  $6 \times 2$       2)  $5 \times 3$       3)  $10 \times 4$
- Refer learners to **Let us learn: 1** on pages 170 and 171 of the Learner's Book. Go through the exercise with learners.

## Review Exercise

## Differentiated Lessons

## Low Ability Learners

- Write a multiplication sentence for these arrays of dots.

1)       2) 

3) 

## High Ability Learners

- Model these multiplication sentences with arrays of dots.

1)  $4 \times 4$       2)  $6 \times 3$

## Assessment for Learning

Refer learners to Learners Book page 173 for exercise.



**Suggested Home Work**

Model arrays for these multiplication sentences.

1)  $3 \times 4$

2)  $5 \times 6$

Write a multiplication sentence for these arrays of dots.

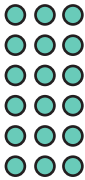
1)



2)



3)



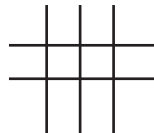
## Lesson 2: Multiplication (using lattice strategy)

**Starter**

Play; "Making Doubles". Call out a number and learners multiply it by 2 and call out the number. E.g. 1)  $2 \rightarrow 4$  2)  $10 \rightarrow 20$   
3)  $30 \rightarrow 60$  4)  $100 \rightarrow 200$

**Let Us Learn**

- Put learners into groups of five. Give each group 20 straws. Write this multiplication sentence on the board.  $2 \times 3 = 6$ . Ask learners to take 2 straws and model them horizontally. Let them take another 3 straws and put them vertically across the horizontal ones.



- Learners count the points of intersections as the answer. So,  $2 \times 3 = 6$ .
- Have learners model  $5 \times 3$  and write the answer. (**critical thinking, collaborative learning, attention to precision**).

- Learners work in pairs and solve these multiplication sentences using the straws.  
1)  $5 \times 2 = ?$  2)  $2 \times 7 = ?$  3)  $10 \times 2 = ?$
- Refer learners to Learner's Book page 172. Go through **Let us learn: 2** with learners. Learners use straws for the questions and find the answers.

**Review Exercise****Differentiated Lessons**

Use straws to model and solve these multiplication sentences.

**Low Ability Learners**

1)  $4 \times 4 = ?$

2)  $5 \times 4 = ?$

**High Ability Learners**

1)  $6 \times 4 = ?$

2)  $8 \times 6 = ?$

**Assessment for Learning**

Refer learners to Learner's Book page 174 for exercise.

**Suggested Home Work**

Use straws to solve these multiplication sentences.

1)  $7 \times 2 = ?$

2)  $10 \times 3 = ?$

3)  $15 \times 1 = ?$

4)  $9 \times 9 = ?$

For additional exercises on this module, refer to pages 130 - 132 of the Workbook

## Module 20: Multiplication (3)

**Content Standard**

**B3.1.2.5:** Demonstrate an understanding of multiplication up to  $5 \times 5$  CONT'D.

**Indicator**

**B3.1.2.5.2** Represent and explain multiplication using rectangular arrays;

**Learning Expectations**

Learners will be able to use the number line to solve multiplication sentences.

**Essentials for Learning**

Learners can use Lattice method to solve multiplication sentences.

**New Words**

Skip count, multiplication.

**Resources**

Number line card

Number of Lessons **3****Lesson 1:** Multiplication (using the number line)**Starter**

Play; "10 more". Call out a number and learners add 10 more and shout aloud the number. E.g. 1)  $0 \rightarrow 10$       2)  $9 \rightarrow 19$   
3)  $6 \rightarrow 16$       4)  $3 \rightarrow 13$

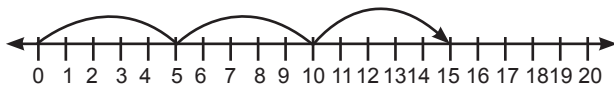
**Find Out**

Refer learners to Learner's Book page 175. Ask learners to complete the missing numbers in the multiplication wheel chart. Learners work in pairs. Ask the following questions.

1. What was done to the 2 and 4 to get 8 ?
  2. What was done to the 2 and 6 to get 12 ?
  3. What was done to the 2 and 3 to get 6 ?
- Learners discuss with their partner and fill in the missing numbers in the location chart.

**Let Us Learn**

- Draw a number line on the board. Label it 10 – 20. Write a multiplication sentence on the board.  $3 \times 5 = ?$  This could be interpreted as 3 rows with 5 columns.



Ask learners:

- How many jumps?
- How many numbers are in a jump?
- Write the multiplication sentence and solve it.  $3 \times 5 = 15$

- Give each group number line cards. They discuss how to solve. 1)  $3 \times 4 = ?$   
2)  $2 \times 6 = ?$  (**critical thinking, collaborative learning, problem solving skills**)
- Have learners work in pairs. They write their own 2 multiplication sentences and solve them.
- Refer learners to **Let us learn: 1** on page 175 and 176 of the Learner's book. Go through the 2 questions with learners. They should work in pairs.

**Review Exercise****Differentiated Lessons**

Use the number line to solve these multiplication sentences.

**Low Ability Learners**

- 1)  $4 \times 4 = ?$       2)  $5 \times 2 = ?$

**High Ability Learners**

- 1)  $6 \times 6 = ?$       2)  $4 \times 5 = ?$

**Assessment for Learning**

Refer learners to Exercise 1 on page 178 and 179 of the Learner's Book for exercise.

**Suggested Home Work**

Draw number lines and use them to solve these multiplication sentences.

- 1)  $3 \times 6 = ?$       2)  $5 \times 5 = ?$   
3)  $12 \times 2 = ?$       4)  $9 \times 2 = ?$

## Lesson 2: Multiplication (using the number chart)

### Starter

Play; "Making 10s". Call out a number and learners add up to make 10 and shout aloud the number e.g. 1)  $0 \rightarrow 10$  2)  $9 \rightarrow 1$   
3)  $6 \rightarrow 4$  4)  $3 \rightarrow 7$

### Let Us Learn

- Learners skip count by 2s from 2 up to 30. (whole class). Now learners skip count by 2s from 2 up to 40. Let them work in pairs (**critical thinking, collaborative learning, attention to precision**).
- Give out the number chart to learners in their groups. They skip count by 2s, 3s, 6s and 10s. They are learning the multiplication table with these numbers (**critical thinking, collaborative learning, attention to precision, leadership skills**).
- Refer learners to **Let us learn: 2** on page 176 of the Learner's Book. Have learners work in pairs. They read the multiples of 2, 3, 4, 6, 8 and 9. Let them write 5 multiples of these numbers.  
e.g. 2: 2, 4, 6, 8, 10, 12  
5: 5, 10, 15, 20, 25  
9: 9, 18, 27, 36, 45, 54  
(**critical thinking, collaborative learning, attention to precision**).

### Review Exercise

### Differentiated Lessons

#### Low Ability Learners

Skip count and read the multiples of 2, 3, 4 from your chart.

#### High Ability Learners

Skip count and read the multiples of 5 up to 10.

### Assessment for Learning

Refer learners to Exercise 2 on page 179 of the Learner's Book.

### Suggested Home Work

Fill in the missing gaps.

5, 10, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, 30, \_\_\_\_\_, \_\_\_\_\_, 45  
2, 4, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, 12, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_  
\_\_\_\_\_, \_\_\_\_\_, 9, 12, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, 24  
\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, 40, \_\_\_\_\_, 60, \_\_\_\_\_, \_\_\_\_\_

## Lesson 3: Multiplication game

### Starter

Have learners skip count in 5s up to 100.

### Let Us Learn

- This is Group Activity Game. Display a big multiplication chart on the board. Give learners instructions as follows.
- Throw a pair of dice in turns (in groups).
- Mark the product made in a throw with a different marker.
- The winner is the group who mark more numbers with the correct products.
- Refer learners to Learner's Book page 177. Learners work in pairs. One throws the pair of dice. He or she finds the product on the chart with his colour. The partner does the same with a different colour. The winner is the first to have 3 colours in a line horizontally, vertically or diagonally.

For additional exercises on this module, refer to pages 133 - 135 of the Workbook

### Assessment for Learning

Refer learners to Exercise 3 on page 180 of the Learner's Book.

## Module 21: Multiplication (4)

## Content Standard

**B3.1.2.5:** Demonstrate an understanding of multiplication up to  $5 \times 5$  CONT'D.

## Indicator

**B3.1.2.5.2:** Represent and explain multiplication using rectangular arrays;

## Learning Expectations

Learners will be able to solve multiplication problems using repeated addition.

## Essentials for Learning

Learners can use number line and array of dots to solve multiplication problems.

## New Words

Repeated addition, multiplication.

## Resources

Bottle caps, straws.

Number of Lessons 1

## Lesson 1: Multiplication (using repeated addition)

## Starter

Learners count and clap simultaneously, 1 – 20.

## Find Out

Refer to page 181 of the Learner's Book.

Have learners work in pairs. Ask learners to solve the problem.

How did you get your answer?

Learners discuss how they got their answers.

Is there a shorter/another method of getting the answer without adding on?

## Let Us Learn

- Put learners into groups of four. Learners answer these questions. How many legs has a hen? Expected answer 2. What about 2 hens, 3 hens and 4 hens?

1 hen = 2 legs

2 hens =  $2 + 2 = 4$  legs

3 hens =  $2 + 2 + 2 = 6$  legs

4 hens =  $2 + 2 + 2 + 2 = 8$  legs

- Call a learner to the front of the class. Learners tell the number of eyes of the learner. Keep on calling other learners to the front of the class until they are five learners.

1 learner = 2 eyes

2 learners =  $2 + 2 = 4$

3 learners =  $2 + 2 + 2 = 6$

4 learners =  $2 + 2 + 2 + 2 = 8$

5 learners =  $2 + 2 + 2 + 2 + 2 = 10$

- Learners tell you the number of times the 2 is repeating e.g. with 5 learners, 2 is repeating 5 times. (**Critical thinking, collaborative learning, attention to precision**).
- Refer them to the number chart and let them skip count by 2s five times and tell the answer. Have learners discuss in their groups, the relationship between addition and multiplication. (When a number is added to itself a certain number of times it is the same as multiplying that number by the number of times it appears). E.g.  $2 + 2 + 2 + 2 + 2 = 2 \times 5 = 10$  (**Critical thinking, collaborative learning, attention to precision**).
- Learners write the multiplication sentences for these numbers  
 $3 + 3 + 3 = 9$       2)  $5 + 5 + 5 + 5 + 5 = 25$
- Refer learners to Learner's Book page 181 to 182. Go through **Let us learn** with learners. They work in groups of five and exchange their work with other group members (**Critical thinking, collaborative learning, attention to precision**).
- Learners draw conclusion that repeated addition could be changed to multiplication sentence.
- Refer learners to **Let us practice** on page 182 of the Learner's Book.

## Review Exercise

Write multiplication sentences for these repeated additions sentences.

**Differentiated Lessons****Low Ability Learners**

1)  $3 + 3 + 3 = 9$

2)  $2 + 2 + 2 + 2 + 2 + 2 = 12$

**High Ability Learners**

1)  $6 + 6 + 6 + 6 + 6 = ?$

2)  $7 + 7 + 7 + 7 + 7 + 7 = ?$

**Assessment for Learning**

Refer learners to Learner's Book page 183 for exercise.

**Suggested Home Work**

Write multiplication sentences for these repeated addition sentences. Find the sum first.

1)  $4 + 4 + 4 + 4 = ?$

2)  $8 + 8 + 8 + 8 = ?$

3)  $10 + 10 + 10 + 10 = ?$

4)  $9 + 9 + 9 + 9 = ?$

For additional exercises on this module, refer to pages 136 - 139 of the Workbook

## Module 22: Division (1)

## Content Standard

**B3.1.2.6:** Demonstrate an understanding of division

## Indicator

**B3.1.2.6.1:** Use concrete and pictorial representations to explain division as equal sharing or partitioning equally into given groups and finding how many are in each group.

## Learners Expectations

Learners need to be able to solve division problems using equal sharing and equal partitioning.

## Essentials for Learning

Learners have been sharing objects among themselves.

## New words

Sharing, division, divide, product, grouping.

## Resources

Bottle caps, oranges, pencils.

Number of Lessons **2**

## Lesson 1: Division by sharing

## Starter

Play; "Half of a number". Call out a number and learners give an answer which is half of the number called. e.g. 1)  $4 \rightarrow 2$  2)  $2 \rightarrow 1$   
3)  $6 \rightarrow 3$  4)  $20 \rightarrow 10$

## Find Out

Refer learners to page 184 of the Learner's Book. Learners say what the two learners are doing and find out the number of oranges each person will get.

## Let Us Learn

- Put 10 books on your table. Call out a boy and a girl to the front of the class. Ask the learners to share the books between them by picking them one by one. They tell the class the number of books each person got. Write the division sentence on the board and introduce the division sign to the class.  $10 \div 2 = 5$ . " $\div$ " means "divide/share".
- Give each group 20 bottle caps. They share among 4 learners, 5 learners and 2 learners respectively. Let them write a division sentence for each. (**critical thinking, collaborative learning, attention to precision**)
- Refer learners to **Let us learn: 1** on page 184 of the Learner's Book. Learners act one question there.  
 $36 \div 6$ . Call 6 learners to the front to share 36 erasers/pencils.

## Review Exercise

## Differentiated Lessons

## Low Ability Learners

- Use diagrams to solve the division sentence. 4 learners share 16 oranges. How many will each get?

## High Ability Learners

- 6 learners share 24 mangoes. How many will each get?.

## Assessment for Learning

Refer learners to Exercise 1 on pages 186 and 187 of the Learner's Book.

## Suggested Home Work

Use diagrams to solve these division sentences.

- 1)  $24:4$  2)  $12:3$  3)  $6:2$

## Lesson 2: Division by Grouping.

## Starter

Play; "half of a number". Call out a number and learners give an answer which is half of the number called. e.g. 1)  $4 \rightarrow 2$  2)  $2 \rightarrow 1$   
3)  $6 \rightarrow 3$  4)  $20 \rightarrow 10$

## Let Us Learn

- Put learners into groups of five. Give out 12 straws to each group. Ask learners to group them into 2 equal groupings. Have learners count the number of straws in



each group and write the division sentence. In writing the division sentence, consider the total number of objects to be shared, 12 (dividend). The number of objects in each group, 6 (divisor) then the number of equal groupings, 2 (answer/quotient)

- Increase the number of straws to 20. Ask learners to put them into 4 equal groupings. They discuss among themselves the number of objects in each group and the total number of objects they had before putting them into equal groupings and write the division sentence  $20 \div 4 = 5$ . (**Critical thinking, collaborative learning, attention to precision, problem solving skills**)
- Refer learners to **Let us Learn: 2** on page 185 of the Learner's Book. Go through with learners.
- Refer learners to **Let us practice** on page 186 of the Learner's Book. Go through the activities with learners.
  - \* 36 erasers put into 6 groupings with the same number of objects in each group.
  - \* 30 bottle caps put into 10 equal groupings.

Learners write division sentence for each question.

### Review Exercise

Draw diagrams for these division sentences and solve them.

### Differentiates Lessons

#### Low Ability Learners

$$8 \div 2 = 4$$

#### High Ability Learners

$$24 \div 6 = 4$$

### Assessment for Learning:

Refer learners to Exercise 2 on pages 188 and 189 of the Learner's Book.

### Suggested Home Work

Write division sentences for these diagrams.

$$1) 12 \div 6 = ?$$

$$2) 8 \div 2 = ?$$

$$3) 10 \div 5 = ?$$

$$4) 15 \div 3 = ?$$

For additional exercises on this module, refer to pages 140 - 146 of the Workbook.

## Module 23: Division (2)

## Content Standard

**B3.1.2.6:** Demonstrate an understanding of division

### Indicator

**B3.1.2.6.2:** Use concrete and pictorial representations to explain division as repeated subtraction or determining the number of times given equal groups can be obtained in (i.e. goes into or can be subtracted from) a given number.

## Learning Expectations

Learners will be able to solve division problems using repeated subtraction.

## Essentials for Learning

Learners can use counting back to do subtraction.

## New Words

Sharing, divide, subtract, divisor, dividend,  
repeated, skip count.

**Resources** Bottle caps, straws, numeral cards number linecards.

## Number of Lessons 1

## Lesson 1: Division (using repeated subtraction)

## Starter

Play; "Making doubles. Learners call out a number. Others say a double of that number. E.g. 1)  $2 \rightarrow 4$     2)  $5 \rightarrow 10$     3)  $8 \rightarrow 16$

## Find Out

Refer learners to **Find out** on page 190 of the Learner's Book. Ask the following questions.

How many mangoes are there?

How are they going to share them?

How many will each person get?

Will they get equal shares?

## Let Us Learn

- Call two learners to the front of the class. Give them 10 erasers to share. The class tell how many each got. Let them take them one by one. Introduce the division sentence to learners.
 

$$\begin{array}{ccccccc} 10 & & \div & & 2 & & = & & 5 \\ \uparrow & & & & \uparrow & & & & \downarrow \\ \text{Dividend} & & & & \text{divisor} & & \div & & \text{quotient} \end{array}$$
- Write this division sentence on the board.  $18 \div 3 = ?$  Give 18 bottle caps to learners. Ask them to keep on subtracting 3 until there is nothing left. Ask learners to count the number of times 3 was subtracted.
 

$18 - 3 = 15 - 3 = 12 - 3 = 9 - 3 = 6 - 3 = 3 - 3 = 0.$  3 was subtracted 6 times.

So,  $18 \div 3 = 6.$

- Write these division sentences on the board for learners to solve using straws/bottle caps 1)  $18 \div 2 = ?$  2)  $30 \div 5 = ?$  (***critical thinking, collaborative learning, attention to precision***).
- Refer learners to **Let us learn** on pages 190 to 192 of the Learner's Book. Go through the five questions with learners.

## Review Exercise

## Differentiated Lessons

Solve these division sentences using repeated subtraction.

## Low Ability Learners

- 1)  $8 \div 2 = ?$                       2)  $12 \div 4 = ?$

## High Ability Learners

- 1)  $36 \div 6 = ?$                       2)  $45 \div 9 = ?$

## Assessment for Learning

Refer learners to Learner's Book page 193 to 194 for exercise.

### Suggested Home Work

Solve these division problems using either repeated subtraction or the number line.

- 1)  $30 \div 5 = ?$                       2)  $6 \div 2 = ?$   
3)  $100 \div 10 = ?$                       4)  $81 \div 9 = ?$

For additional exercises on this module, refer to pages 147 - 148 of the Workbook

## Module 24: Division (3)

**Content Standard**

**B3.1.2.6:** Demonstrate an understanding of division

**Indicator**

**B3.1.2.6.3:** Use concrete and pictorial representation to explain division as inverse of multiplication.

**Learning Expectations**

Learners will be able to relate division as inverse of multiplication.

**Essentials for Learning**

Learners can do division using equal groupings or repeated subtraction.

**New words**

Divide, inverse, multiplication, counting multiply.

**Resources**

Bottle caps, numeral cards.  
Number of lessons 1

Number of Lessons 1

**Lesson 1:** Division (using inverse multiplication)**Starter**

Play; "Counting by 2s. Learners count by 2s up to 20: 2, 4, 6, 8 ....

**Find Out**

Refer learners to page 195 of the Learner's Book.

Ask these questions. How do you solve these?  
Work in pairs.

Learners brainstorm to find answers to the problem.

**Let Us Learn**

- Put learners into groups of five. Write  $12 \div 3 = ?$  This could be changed into multiplication sentence as  $3 \times ? = 12$ ,  $\rightarrow 4 \times 3 = 12$ ,  $3 \times 4 = 12$  or  $12 \div 3 = 4$
- Refer learners to Learner's Book page 195 to 196. Go through **Let us learn: 1** with learners.

**Review Exercise**

Let learners work in pairs. Solve these division sentences.

**Differentiated Lessons****Low Ability Learners**

- $4 \times 3 = 12$
- $7 \times 3 = 21$   
 $12 \div 4 =$   
 $21 \div 7 =$

**High Ability Learners**

- $32 \div 8 =$
- $45 \div 5 =$
- If  $9 \times 8 = 72$  Then  $72 \div 9 =$
- if  $12 \times 4 = 48$  then  $48 \div 4 =$

**Assessment for Learning**

Refer learners to Learner's Book page 197 to 198 for exercise.

**Suggested Home work**

Solve these sentences

- $36 \div 4 = ?$
- $25 \div 5 = ?$
- $40 \div 8 = ?$
- $30 \div 2 = ?$

For additional exercises on this module, refer to pages 149 - 152 of the Workbook

Encourage learners to do the reflection exercises on pages 199 and 200 after this sub-strand.

Learners complete the self-assessment table on page 201. This will help you know each learner's strength and weaknesses.

## Module 1: Unit fractions

## Content Standard

**B3.1.3.1:** Develop an understanding of fractions using concrete and pictorial representations and write fractions in words and symbols.

## Indicator

**B3.1.3.1.1:** Understand a unit fraction by explaining the fraction  $\frac{1}{f}$  as the quantity obtained by taking 1 part when a whole is partitioned into  $f$  equal parts and that a fraction  $\frac{1}{f}$  is the quantity obtained by taking 1 part of the  $\frac{1}{f}$  size.

## Learning Expectation

Learners will be able to identify name unit fractions and make unit fractions.

## Essential for Learning

Learners can identify half of a whole.

## New Words

Unit, part, half, fraction, numerator, denominator.

## Resources

Sheets of paper, colour pencils, apples or oranges, counters, straws, etc.

Number of Lessons 2

## Lesson 1: Unit fractions (1)

## Starter

Play "Show me" the number 15 or 10.

Pair or whole class activity to practice making groups of objects.

Call out a number, learners must use their counters to create a set with that number of objects and count them.

## Variation –Place Value

Call out a number larger than 10.

Learners must use their bundles of sticks and 1s to represent that number on their desk or on a number or 10s frame.

## Find Out

Refer learners to page 202 of the Learner's Book.

Say: Look at the fractions carefully.

Ask: What is common about all the fractions?

Elicit that they all have one part shaded. Lead the class to name the fractions.

E.g. A is  $\frac{1}{4}$  B is  $\frac{1}{3}$

## Let us Learn

- Put learners into groups of six. Give each group sheets of paper.  
Demonstrate how a unit fraction can be obtained. Demonstrate using an apple/

orange and a sheet of paper.

- Present each group with about 2 or 3 unit fractions, e.g.  $\frac{1}{7}$  or  $\frac{1}{4}$
- Task them to demonstrate the fractions by dividing the sheet and shading one out of it. (*Justification of ideas, collaborative learning, critical thinking, attention to precision*)
- Direct learners to **Let us Learn** on pages 202 and 203 of the Learner's Book.  
Discuss the names of the unit fractions there.

## Review Exercise

## Differentiated lesson

## Low ability learners

- Learners to fold different size of papers into two equal parts and shade one part.

## High ability learners

- Make a unit fraction of a group of objects.  
E.g. 2 is  $\frac{1}{5}$  of 10 items.

## Assessment for Learning

Refer learners to Exercise 1 on pages 203 and 204 of the Learner's Book.

## Lesson 2: Unit fractions (2)

### Starter

Play "Show me" the number 15 or 10.

Pair or whole class activity to practice making groups of objects.

Call out a number, learners must use their counters to create a set with that number of objects and count them.

### Variation –Place Value

Call out a number larger than 10.

Learners must use their bundles of sticks and 1s to represent that number on their desk or on a number or 10s frame.

### Let us learn

- Revise previous lesson on unit fractions.
- Use learners' groups from previous lesson. Present each group with straws or bottle caps. Task each group to make a concrete demonstration of given unit fractions.
- Take learners out of the class. Learners to identify count any number of any item (e.g. trees) and make a unit fraction out of it. (**Justification of ideas, collaborative learning, critical thinking, attention to precision**)

### Review Exercise

### Differentiated lesson

#### Low ability learners

- Learners identify and make their own unit fractions
- Make a unit fraction of a group of objects.

E.g. 2 is  $\frac{1}{5}$  of 10 items.

#### High ability learners

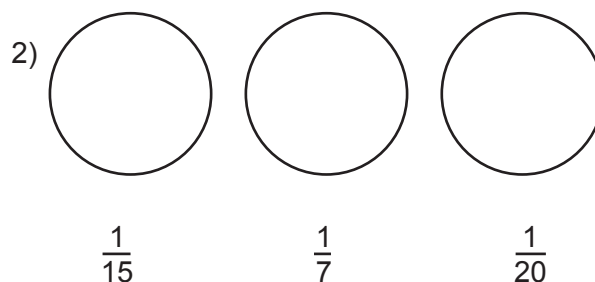
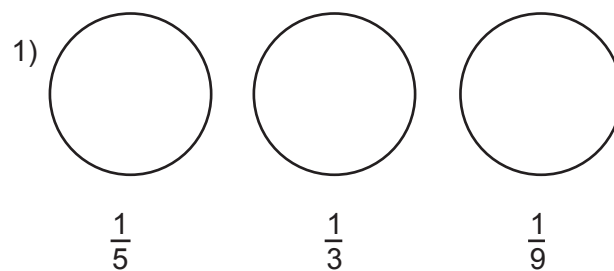
- Task learners to tell which unit fraction is larger and explain that the larger the denominator of a unit fraction, the smaller that fraction.

### Assessment for Learning

Refer learners to Exercise 2 on pages 204 to 205 of the Learner's Book.

### Suggested Home works

Divide the circles and shade to show the following unit fractions.



- 3) Tell which of the unit fractions is larger.

e.g.  $\frac{1}{3} > \frac{1}{5}$

$\frac{1}{2}$        $\frac{1}{5}$

$\frac{1}{7}$        $\frac{1}{4}$

$\frac{1}{3}$        $\frac{1}{13}$

$\frac{1}{6}$        $\frac{1}{9}$

$\frac{1}{12}$        $\frac{1}{8}$

For additional exercises on this module, refer to pages 151 - 152 of the Workbook.

## Module 2: Multiples of unit fractions

## Content Standard

**B3.1.3.1:** Develop an understanding of fractions using concrete and pictorial representations and write fractions in words and symbols.

## Indicator

**B3.1.3.1.1:** Understand a unit fraction by explaining the fraction  $\frac{1}{f}$  as the quantity obtained by taking 1 part when a whole is partitioned into  $f$  equal parts and that a fraction  $\frac{1}{f}$  is the quantity obtained by taking 1 part of the  $\frac{1}{f}$  size.

## Learning Expectation

Learners will be able to make unit fractions and add multiples of unit fractions.

## Essential for Learning

Learners can identify and make unit fractions.

## New Words

Unit, part, multiples, fraction.

## Resources

Sheets of paper, colour pencils, apples or oranges, counters, straws, number lines etc.

Number of Lessons 2

## Lesson 1: Multiples of unit fractions (1)

## Starter

Play: "How many" (Whole class activity to practice counting objects)

Ask learners how many:

- toes they have?
- finger nails they have?
- legs they have?
- learners are sitting on one desk?
- windows on one side of your class?
- exercise books do you have for maths?

Continue the starter with other objects familiar to learners.

## Find Out

Refer learners to page 206 of the Learner's Book.

Say: Look at the fractions carefully.

Ask: Are they the same? Can we add the two fractions? What will be the new fraction when we add them?

## Let us Learn

- Review learners' knowledge on unit fraction.
- Put learners into groups of about six. Present learners with unit fractions and task them to demonstrate it using sheets of paper or drawing.

- Direct learners to the first part of **Let us Learn** on page 206 of the Learner's Book. Explain and demonstrate how to make multiples of unit fractions.
- Present each group with some unit fractions and task them to add them.

$$\text{E.g. } \frac{1}{5} + \frac{1}{5} + \frac{1}{5} = \frac{3}{5}$$

*(Justification of ideas, collaborative learning, critical thinking, attention to precision)*

- Explain to learners that, when we make multiples of unit fractions and we get the same denominator and numerator it is equal to 1.

## Review

## Differentiated lesson

## Low Ability Learners

- Learners add multiples of unit fractions.

$$\text{E.g: 1) } \frac{1}{2} + \frac{1}{2} = \quad 2) \frac{1}{4} + \frac{1}{4} + \frac{1}{4} =$$

## High Ability Learners

- Learners break a given non-unit fraction into several unit fractions.

$$\text{E.g. } \frac{3}{7} = \frac{1}{7} + \frac{1}{7} + \frac{1}{7}$$

## Assessment for Learning

Refer learners to Exercise 1 on page 207 of the Learner's Book.



## Lesson 2: Multiples of unit fractions (2)

### Starter

Play: "How many" (Whole class activity to practice counting objects)

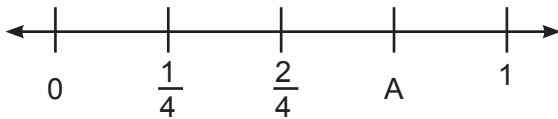
Ask learners how many:

- toes they have?
- finger nails they have?
- legs they have?
- learners are sitting on one desk?
- windows on one side of your class?
- exercise books do you have for maths?

Continue the starter with other objects familiar to children.

### Let us learn

- Revise previous lesson on multiples of unit fractions with learners.
- Use learners' groups from previous lesson. Demonstrate how to use number line to add unit fractions.



- Present each group with number line sheets  
Task each group to use the number lines to represent multiples of unit fractions.  
Learners present their results to the class.  
**(Collaborative learning, justification of ideas)**

### Review Exercise

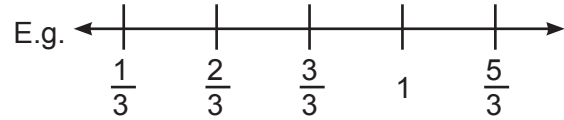
#### Differentiated lesson

##### Low Ability Learners

- Use the number line to add unit fractions.

### High Ability Learners

- Extend a unit fractions beyond 1 on the number line.



### Assessment for Learning

Refer learners to page 208 of the Learner's Book for exercise.

### Suggested Home works

Fill in the missing spaces with the correct fractions.

1.

$$\frac{1}{5} \quad \frac{\quad}{5} \quad \frac{3}{5} \quad \frac{4}{5} \quad \frac{\quad}{5}$$

2.

$$\frac{1}{7} \quad \frac{2}{7} \quad \frac{\quad}{7} \quad \frac{\quad}{7} \quad \frac{5}{7} \quad \frac{6}{7} \quad \frac{\quad}{7}$$

3.

$$\frac{\quad}{6} \quad \frac{2}{6} \quad \frac{3}{6} \quad \frac{\quad}{6} \quad \frac{5}{6} \quad \frac{6}{6}$$

4.

$$\frac{1}{8} \quad \frac{2}{8} \quad \frac{\quad}{8} \quad \frac{4}{8} \quad \frac{5}{8} \quad \frac{6}{8} \quad \frac{\quad}{8} \quad \frac{\quad}{8}$$

5.

$$\frac{1}{4} \quad \frac{\quad}{4} \quad \frac{3}{4} \quad 1 \quad \frac{5}{4} \quad \frac{\quad}{4}$$

For additional exercises on this module, refer to pages 153 - 156 of the Workbook

## Module 3: Fractions of a group

**Content Standard**

**B3.1.3.1** Develop an understanding of fractions using concrete and pictorial representations and write fractions in words and symbols.

**Indicator**

**B3.1.3.1.2:** Understand, explain and demonstrate that fractions can be used to represent parts of a group of objects, point on a line, or distances on a number line [Read and write fractions using words and symbols. (E.g. one-half, two halves, thirds, fifths etc.)]

**Learning Expectation**

Learners will be able to make fraction out of a group.

**Essential for Learning**

Learners can identify fractions of a unit.

**New Words**

Fraction, part, group.

**Resources**

Sheets of paper, colour pencils, apples or oranges, counters, straws, number lines etc.

Number of Lessons **2****Lesson 1: Fraction of a group (1)****Starter**

Play: "How many" 10s and 1s (Whole class activity to practice place value)

Write a number between 10 and 20 on board  
Learners must identify number of groups of 10s and number of 1s in the number.

E.g.



2 tens and 3 ones.

**Find Out**

Refer learners to **Find out** on page 209 of the Learner's Book.

Say: Look at the pictures.

How many has been circled in each group?

Can you say that in fraction?

**Let us Learn**

- Review learners' knowledge on fraction of a unit whole.
- Count six bottle caps and place them in front of the class.  
Call out two learners to share the six bottle caps equally.  
Lead the class to write fraction names for the amount each learner got. That is,  $\frac{3}{6}$ .
- Discuss with learners that since they divided the bottles cups equally between

them, we can also say each had 3 out of 6, which is represented as  $\frac{3}{6}$  in fraction. 3 is half of 6, this can also be represented in fraction as  $\frac{1}{2}$ .

- Direct learners to **Let us Learn** on page 209 of the Learner's Book.  
Discuss each of the pictures with the class.
- Put learners into groups and present each group with some straws.  
Assign them fractions for them to represent using the straws.

**Review Exercise****Differentiated lesson****Low Ability Learners**

- Give learners 15 bottle caps. They make different groups of fractions out of the objects. They can work in pairs.

**High Ability Learners**

- Learners make different fractions from the same group of objects. Example 30 bottle caps.

**Assessment for Learning**

Refer learners to Exercise 1 on pages 210 and 211 of the Learner's Book.

## Lesson 2: Fraction of a group (2)

### Starter

Play: "How many" 10s and 1s (Whole class activity to practice place value)

Write a number between 10 and 20 on board  
Learners must identify number of groups of 10s and number of 1s in the number.

E.g.



2 tens and 3 ones.

### Let us learn

- Revise previous lesson on fraction out of a group with learners.
- Use learners' groups from previous lesson. Present each group with task sheets for them to identify the fractions. Give each group fractions, say  $\frac{3}{6}$ , task learners to draw and shade to represent the fraction.
- Learners present their results to the class. (*Collaborative learning, Justification of ideas*)

### Review Exercise

#### Differentiated lesson

##### Low ability learners

- Learners to demonstrate a given fraction using counters/straws.

### High ability learners

- Learners compare two given fractions and tell which is larger.

E.g.  $\frac{3}{6}$  is bigger than  $\frac{2}{6}$ .

### Assessment for Learning

Refer learners to Exercise 2 on page 211 of the Learner's Book.

### Suggested Home works

Draw and shade to show the following fractions

1	$\frac{2}{8}$
2	$\frac{1}{2}$ of 6
3	$\frac{3}{9}$
4	$\frac{1}{2}$ of 8
5	$\frac{2}{5}$

For additional exercises on this module, refer to pages 157 - 159 of the Workbook.

## Module 4: Comparing and ordering unit fractions

## Content Standard

**B3.1.3.1:** Develop an understanding of fractions using concrete and pictorial representations and write fractions in words and symbols

## Indicator

**B3.1.3.1.3:** Compare and order unit fractions and fractions with like denominators by using concrete models, pictorial representations and number line.

## Learning Expectation

Learners will be able to compare and order unit fractions.

## Essential for Learning

Learners can identify and make unit fractions.

## New Words

Fraction, order, compare

## Resources

Sheets of paper, colour pencils, apples or oranges, counters, straws, number lines etc.

Number of Lessons

1

## Lesson 1: Comparing fractions with the same denominator

## Starter

Play: "How many" 10s and 1s (Whole class activity to practice place value).

Write a number between 10 and 20 on the board.

Learners must identify number of groups of 10s and number of 1s in the number.

E.g.



2 tens and 4 ones.

## Find Out

Refer learners to page 212 of the Learner's Book.

Say: Look at the pictures.

How can we tell which of the two fractions is bigger?

Take feedback from learners.

## Let Us Learn

- Review learners' knowledge on unit fractions.
- Direct learners to **Let us Learn** question 1, on page 212 of the Learner's Book. Discuss the unit fractions with learners. Explain that if the fractions have the

same denominator, then we compare the numerators to show which of the fractions is bigger.

E.g.  $\frac{2}{6}$  is bigger than  $\frac{1}{6}$ .

- Pair learners. Give them task sheet with pairs of fractions with the same denominator to compare. Then give learners a number of fractions to compare and order. (**Collaborative learning, Critical thinking, Justification of ideas**)

## Review Exercise

## Differentiated lesson

## Low ability learners

- Learners compare and order the following pairs of fractions from the smallest to the biggest.

$$\frac{2}{6} \quad \frac{1}{6} \quad \frac{3}{6} \quad \frac{5}{6}$$

## High ability learners

- Learners write six fractions with the same denominator, compare and order from the smallest to the biggest and vice versa.

## Assessment for Learning

Refer learners to Exercise 1 on pages 213 and 214 of the Learner's Book.

**Let Us Learn**

- Revise previous lesson on comparing and ordering fraction with same denominators with learners.
- Demonstrate how to compare fractions with the same denominators using diagrams with learners.

E.g. Compare  $\frac{3}{8}$  and  $\frac{5}{8}$ .



- From the diagrams, above, explain to learners that to compare fractions of the same denominators using diagrams, sketch the fractions making sure that the length of the shapes are the same, then compare the shaded regions. Therefore, comparing the shaded portions above, ask learners to tell you the one that has a bigger shaded area.  $\frac{5}{8}$  has a bigger shaded area. Therefore  $\frac{5}{8}$  is bigger than  $\frac{3}{8}$ .
- Pair learners. Give them task sheets with pairs of fractions with the same denominators to compare. Then give learners a number of fractions to compare and order. (**Collaborative learning, Critical thinking, Justification of ideas**)

**Review Exercise****Differentiated lesson****Low Ability Learners**

- Learners circle the fraction that is greater.

**High Ability Learners**

- Learners sketch to show and compare which of the following fractions is larger.

1)  $\frac{2}{6}$   $\frac{3}{6}$   $\frac{4}{6}$       2)  $\frac{1}{5}$   $\frac{2}{5}$   $\frac{5}{5}$

**Assessment for Learning**

Refer learners to Exercise 2 on page 214 of the Learner's Book.

**Suggested Homework**

Which fraction is bigger? Circle it.

1	$\frac{2}{5}$ and $\frac{3}{5}$
2	$\frac{3}{4}$ and $\frac{1}{4}$
3	$\frac{2}{9}$ and $\frac{1}{9}$
4	$\frac{5}{5}$ and $\frac{2}{5}$
5	$\frac{2}{7}$ and $\frac{3}{7}$

Compare and order the following fractions from small to biggest.

1	$\frac{3}{5}$ , $\frac{1}{5}$ , $\frac{2}{5}$ .
2	$\frac{3}{7}$ , $\frac{1}{7}$ , $\frac{5}{7}$ , $\frac{2}{7}$ .
3	$\frac{2}{9}$ , $\frac{7}{9}$ , $\frac{5}{9}$ , $\frac{1}{9}$ .
4	$\frac{2}{8}$ , $\frac{7}{8}$ , $\frac{3}{8}$ , $\frac{6}{8}$ .
5	$\frac{2}{6}$ , $\frac{4}{6}$ , $\frac{6}{6}$ , $\frac{3}{6}$ .

For additional exercises on this module, refer to pages 160 - 163 of the Workbook.

Encourage learners to do the reflection exercises on page 215 after this sub-strand.

Learners complete the self-assessment table on page 216. This will help you know each learner's strength and weaknesses.

## Module 1: Paying the exact amount

### Content Standard

**B3.1.4.1:** Determine the value of coins and notes in order to solve monetary transactions.

### Indicator

**B3.1.4.1.1:** Use different denominations of money (1, 2, 5, 10, 20, 50 cedis notes and pesewa coins) to buy and give change.

### Learning Expectation:

Learners will be able to pay an exact amount for items bought.

### Essential for Learning

Learners can identify the value of the cedi coins and notes.

### New Words

Cedi, pesewas, note, coin, change

### Resources

Ghana pesewa coins, 1 match box, milk, milo, chocomilo, bottle of water, school bag, exercise books, pen, pencil, etc.

Number of Lessons **3**

## Lesson 1: Paying the exact amount (1)

### Starter

Call out a number. Learners make a group with that number using counters or straws. Then tell them to make a set beside the first set that has either more than, less or the same number of objects as the first set. Have them compare and justify their answers.



### Find Out

Direct learners to page 217 of the Learner's Book.

Say: Look at the items.

Ask: Can you identify and name the items?

Can you count and pay the exact amount on the price tag?

Can you make different combinations of the cedi notes and coins to pay for the same amount?

### Let Us Learn

- Review the identification of the Ghana cedi notes and coins with learners. Show pictures or real cedi notes and coins to learners. Let learners tell you the names.
- Also, review lessons on comparing the value of the coins and notes with learners.

- Have a whole class discussion on how much learners buy items. E.g. pen, pencil, eraser, etc.
- Put learners into small groups of about five. Display some items in front of each group and task them to discuss and agree on how much they would sell each item.
- Groups should make their own price tags for the items. (**Collaborative Learning, Justification of Ideas**)
- Direct learners to **Let us Learn** on pages 217 and 218 of the Learner's Book. Lead the class to discuss the items and the prices.

### Review Exercise

#### Differentiated lesson

##### Low ability learners

- Task learners to tell you which cedi coins or notes they will need to buy items that cost:  
1) 50p      2) GH¢ 2      3) GH¢ 1

##### High ability learners

- Task learners to tell you which cedi coins or notes they will combine to buy items that cost:  
1) GH¢ 5.30p      2) GH¢ 2.60p  
3) GH¢ 13.65p      4) 99p

### Assessment for Learning

Refer learners to Exercise 1 on pages 218 and 219 of the Learner's Book for exercise.



## Lesson 2: Paying the exact amount (2)

### Starter

Call out a number. Learners make a group with that number using counters or straws. Then tell them to make a set beside the first set that has either more than, less or the same number of objects as the first set. Have them compare and justify their answers.

### Let us Learn

- Create learning centres in the class. They should include:
  - a. A currency trade centre where learners can exchange high value notes for smaller ones in order to pay exact amount.
  - b. A shop/market where items are sold.
- Use learners' previous groups. Give each group some amount of money. Demonstrate how you will trade off GH¢ 20 for smaller denominations in order to pay for an exact amount of items worth GH¢ 17.
- Guide each group to trade off bigger amounts and then buy and pay the exact amount for items. Each group should share their experience with the whole class. (*Collaborative Learning, Justification of Ideas, Critical thinking, Communication skills*)

### Review Exercise

#### Differentiated Lessons

##### Low Ability Learners

- Present learners with a GH¢ 10 note and task them to exchange for smaller denominations to pay the exact amount for items that cost GH¢ 5 and GH¢ 1.50p.

##### High Ability Learners

- Present learners with a GH¢ 20 note and task them to tell how much change they will take if they bought items that cost:
 

1) GH¢ 5	2) GH¢ 3.20
3) GH¢ 10.5	4) GH¢ 18.55

#### Assessment for Learning

Refer learners to page 220 of the Learner's Book for exercise.

## Lesson 3: Paying the exact amount (3)

### Let us Learn

- Review previous lesson on paying exact amount with learners.
  - Ask groups to move out of the class to the canteen and buy items of their choice. Task them to record their transactions and explain it to the class when they come back. (*Collaborative Learning, Justification of Ideas, Critical thinking*)
- Questions to ask:
- a. What did you buy?
  - b. How much was it?
  - c. What combination of denominations did you use?
  - d. What other combinations could you have used?
  - e. Was there any change?
  - f. How much was the change?

### Review Exercise

#### Differentiated lesson

##### Low Ability Learners

- Present learners with a cedi note and task them to exchange for smaller denominations to pay for exact amount.

##### High Ability Learners

- Present learners with a cedi note and task them to tell how much change they will take if they bought an item of less price.

#### Assessment for Learning

Refer learners to page 220 of their learners' book for exercise

#### Suggested homework

- Record your transactions on items you bought at home to answer the following questions:
  1. What did you buy?
  2. How much was it?
  3. What combination of denominations did you use?
  4. What other combinations could you have used?
  5. Was there any change?
  6. How much was the change?

For additional exercises on this module, refer to pages 164 - 169 of the Workbook.

## Module 2: Taking change

**Content Standard**

**B3.1.4.1.** Determine the value of coins and notes in order to solve monetary transactions

**Indicator**

**B3.1.4.1.1** Use different denominations of money (1, 2, 5, 10, 20, 50 cedis notes and pesewa coins) to buy and give change

**Learning Expectation**

Learners will be able to buy items and take change.

**Essential for Learning**

Learners can exchange a bigger denomination for a smaller but equivalent denominations.

**New Words**

Cedi, pesewas, note, coin, change.

**Resources**

Ghana pesewa coins, 1 match box, milk, milo, chocomilo, bottle of water, school bag, exercise books, pen, pencil, etc.

Number of Lessons **2**

## Lesson 1: Taking change (1)

**Starter**

Call out a number. Learners make a group with that number using counters or straws. Then tell them to make a set beside the first set that has either more than, less or the same number of objects as the first set. Have them compare and justify their answers.



5



same as



less



more

**Find Out**

Direct learners to page 222 of the Learner's Book.

Say: Look at the items.

Ask: Can you pay and take change?

What denomination would you prefer to use?

How much change would you take if you gave a particular denomination?

**Let Us Learn**

- Review previous lesson on paying exact amount with learners.
- Explain to learners that sometimes we may not be able to pay the exact amount. When that happens, we have to give a bigger denomination and take a change.

- Display an item with a price tag and demonstrate to learners, how you can purchase the item and take change.
- Put learners into small groups of about five. Display some items with price tags in front of each group. Task each group to discuss and tell the change they will take if they were buying with a particular denomination. (*Collaborative Learning, Justification of Ideas, Critical thinking, Communication skills*)
- Direct learners to **Let us learn** on pages 222 and 223 of the Learner's Book. Lead the class to discuss the items, the money paid and the change received.

**Review Exercise**

- Learners to tell the change to be taken when they buy an item worth GH¢ 3 but paid GH¢ 5.
- Give them other combinations to come out with the change they will receive.

**Assessment for Learning**

Refer learners to page 224 of the Learner's Book for exercise.

## Lesson 2: Taking change (2)

### Starter

Call out a number. Learners make a group with that number using counters or straws. Then tell them to make a set beside the first set that has either more than, less or the same number of objects as the first set. Have them compare and justify their answers.



### Let Us Learn

- Create learning centres in the class. E.g. A shop/market where items are sold.
- Use learners' previous groups.  
Give each group some amount of money to buy and take change.
- Engage learners to try out some calculations involving change.  
E.g.  $\text{Gh}¢25.50 - \text{Gh}¢10.50 = \text{Gh}¢15.00$   
Refer them to page 223 of the Learner's Book for more examples.

### Review Exercise

### Differentiated lesson

#### Low ability learners

- Give learners some calculations to find the change.
  - 1)  $\text{Gh}¢20.00 - \text{Gh}¢11.50 =$
  - 2)  $\text{Gh}¢25.50 - \text{Gh}¢9.50 =$
  - 3)  $\text{Gh}¢15.00 - \text{Gh}¢11.50 =$

### High ability learners

- Task learners to agree or disagree to a change they receive when they buy items.
  - 1) Kofi paid Gh¢20.00 for a bowl of mangoes worth Gh¢10.50. He was given a change of Gh¢9.00.
  - 2) Mamle paid Gh¢20.50 for a textbook worth Gh¢18.20. She was given a change of Gh¢4.00.
  - 3) Fafa paid Gh¢20.00 for a pack of exercise books worth Gh¢20.00. She was given no change.

### Assessment for Learning

Refer learners to page 225 of the Learner's Book for exercise.

### Suggested homework

- Record your transactions on items you bought at home to answer the following questions:
  1. What did you buy?
  2. How much was it?
  3. What combination of denominations did you use?
  4. What other combinations could you have used?
  5. Was there any change?
  6. How much was the change?

For additional exercises on this module, refer to pages 170 - 172 of the Workbook.

Encourage learners to do the reflection exercises on page 226 after this sub-strand.

Learners complete the self-assessment table on page 226. This will help you know each learner's strength and weaknesses.



2

Strand:

**Algebra**

## Module 1: Increasing and decreasing patterns

## Content Standard

**B3.2.1.1** Recognise, create, extend, describe, and use patterns and rules to solve mathematical tasks

## Indicator:

**B3.2.1.1.1** Demonstrate an understanding of increasing and decreasing patterns by extending the next two or three terms and identifying errors or missing elements.

## Learning Expectation

Learners will be able to: identify a rule (increasing or decreasing) for a given pattern.

## Essential for Learning

Learners can group objects, 2D shapes based on a given criteria.

## New Words

Patterns, sequence, difference, terms

## Resources

2D shapes, numeral cards

Number of Lessons **2**

## Lesson 1: Identifying pattern rule for a given pattern

## Starter

Play: "1 clap 1: learners recite 1 clap 1, 1 clap 2, 1 clap 3 – 1 clap 9.

They recite and clap simultaneously.

## Find Out

Refer learners to **Find out** on page 228 of the Learner's Book. Learners work in pairs and read the numbers from 86 – 61. They discuss among themselves. Are the numbers increasing or decreasing? What are the differences? Are they the same?

## Let us Learn

- Take learners outside the classroom. Let them form a big circle.
- They play the game "1 squat 1" up to "1 squat 9" and restart.
- The first person starts: 1 squat 1, the second person says 1 squat 2, and so on until they reach 1 squat 9. They squat and get up with the rhythm.
- Back to the classroom, learners continue these pattern and find the rule:  
1) 1, 2, 3; 1, 2, 4; 1, 2, 5; 1, 2, 6;  
Rule: The last number in each set is increasing by 1.  
2) 4, 8, 12, 16, 20, 24, 28, ...  
Rule: The numbers are increasing by 4.  
**(critical thinking, problem solving skills, collaborative learning)**

- Refer learners to **Let us learn: 1** on pages 228 and 229 of the Learner's Book. Go through the first question with learners. 7, 10, 13, 16, 19. Learners discuss in their groups, identify the pattern and continue with three terms. Learners should come out with the rule. The rule is: Adding 3. So the numbers are increasing by 3.
- Refer learners to the next questions. They critically look at the pattern continue with 2 terms and identify the rule. **(critical thinking problem solving skills collaborative learning)**

## Review Exercise

## Differentiated lesson

## Low ability learners

- Continue with the next 3 terms and find the rule.

1 2, 4, 8, \_\_\_\_, \_\_\_\_, \_\_\_\_.

The rule is: \_\_\_\_\_

## High ability learners

- Continue with the next 3 terms and find the rule.

1 1, 4, 9, 16, \_\_\_\_, \_\_\_\_, \_\_\_\_.

The rule is \_\_\_\_\_

## Assessment for Learning

Refer learner to Learner's Book page 230 for exercise.



**Suggested Home Work**

Continue with 3 terms and find the rule.

- 1 10, 15, 20, 25 \_\_\_\_\_
- 2 30, 40, 50, 60 \_\_\_\_\_
- 3 9, 12, 15, 18 \_\_\_\_\_
- 4 Start with 88 make 5 patterns by adding 5 each time.

## Lesson 2: Creating a pattern for a given rule

**Starter**

Play: "1 squat 1" up to "1 squat 9".

**Let Us Learn**

- Have learners work in pairs.  
Write these patterns on the board. 40, 42, 44, ...., . Learners continue with 3 terms and find the rule.
- Ask learners in pairs to create their own pattern. They exchange their work with, another group, examine the pattern and, identify the rule. (**Critical thinking, problem solving skills, collaborative learning**)
- Refer learners to **Let us learn: 2** on page 229 of the Learner's Book.  
Go through questions 1 and 2 with learners. (**collaborative learning, critical thinking, attention to precision**)

**Review Exercise****Differentiated lessons**

Create 3 pattern with these given rules.

Work in pairs.

**Low Ability Learners**

- Start at 25. Add 5 to each term. Write 5 terms.

**High Ability Learners**

- Subtract 6 from each term start from any number.

**Assessment for Learning**

Refer learners to Learner's Book page 231 for exercises.

**Suggested Home Work**

1. Make a pattern by adding 2 to each term.  
Start from any number. Make 5 terms.
2. Start from 100. Subtract 10 from each term. Make a pattern of 5 terms.
3. The rule is: add 3. Make your own pattern, start.
4. Use your own rule to create a 5 term pattern.

For additional exercises on this module on this module, refer to pages 174 of the Workbook

## Module 2: Errors in patterns

**B3.2.1.1** Recognise, create, extend, describe, and use patterns and rules to solve mathematical tasks

**Indicator:**

**B3.2.1.1.1** Demonstrate an understanding of increasing and decreasing patterns by extending the next two or three terms and identifying errors or missing elements.

**Learning Expectation**

Learners will be able to: identify errors and find the missing terms in a pattern.

**Essential for Learning**

Learners can make patterns when given rules and can continue patterns with 2 or 3 terms.

**New Words**

Error, sequence, previous, pattern

**Resources:** Numeral cards, 2D shapes.

Number of Lessons **1**

## Lesson 1: Identifying errors in patterns

**Starter**

Play: "Making 10s" Call out a number and learners add a number to make 10 and call out the number.

**Find Out**

Refer learners to Learner's Book page 232. Learners study the pattern sequence, find the rule and continue with the next term. Have learners work in pairs. (*critical thinking, collaborative Learning*)

**Let Us Learn**

- Arrange 2D shapes on the board. Ask learners to observe it critically. Identify the rule and what has changed in the pattern.



There is an error at the third term. Instead of square a triangle was put there.

- Have learners copy this and identify the errors: AAB, AAB, BAB, AAB. (*Critical thinking, collaborative learning*)
- Refer learners to **Let us learn** on page 232 of the Learner's Book. Go through the two exercises with learners. They should identify the error in question 1 and find the missing numbers in question 2.

**Review Exercise****Differentiated Lessons****Low Ability Learners**

Identify the error in the given patterns and find, the missing numbers. Learners must work in pairs.

- 3, 6, 9, 10, 12,
- 10, 20, -, 40 -, - .

**High Ability Learners**

Have learners work in pairs.

- Create your own pattern with an error. Let your partner identify it.
- Fill in the missing number and find the error if any.  
80, 75, 70, -, 60, 65

**Assessment for Learning**

Refer learners to Learner's Book pages 233 and 234 for exercise

**Suggested Home Work:**

Find the missing numbers in these patterns.

- 66, 56, \_\_, \_\_, 26, \_\_
  - 30, 43, \_\_, \_\_, 65, \_\_
- Identify the errors in these patterns.
- 60, 75, 90, 100, 115, 130, 150
  - 421, 32, 43, 63, 53, 73

For additional exercises on this module, refer to pages 177 of the Workbook.

**Module 3:** Increasing and decreasing pattern (100 number chart)

**B3.2.1.1** Recognise, create, extend, describe, and use patterns and rules to solve mathematical tasks

**Indicator:**

**B3.2.1.1.1** Demonstrate an understanding of increasing and decreasing patterns by extending the next two or three terms and identifying errors or missing elements.

**Learning Expectation:**

Learners will be able to: locate and describe increasing/decreasing patterns in 100

number chart diagonally, horizontally and vertically.

**Essential for Learning:**

Learners can identify errors in patterns, and can fill in missing numbers in a pattern.

**New words**

increasing, decreasing column, diagonal vertical, row, horizontal

**Resources:** 100 Number chart.

Number of Lessons **2**

**Lesson 1:** Locating and describing patterns**Starter**

Have learners count by 10s up to 100 while clapping simultaneously.

**Find Out**

Refer learners to page 235 of the Learner's Book. Learners work with a partner and study the picture.

Identify what the learner is doing and write a pattern for it.

**Let Us Learn**

- Learners count by 5s up to 50 and count by 10s up to 100. Write the numbers on the board and ask learners to tell the class the pattern they have identified (**collaborative learning, attention to precision**)
- Refer learners to **Let us learn** on pages 235 to 237 of the Learner's Book. Give each group a 100 numeral chart. Have learners work in pairs. They should study the chart and come out with at least 2 patterns.
- Now have learners study the numbers diagonally, vertically and horizontally and write their own patterns and write rules for them. (**Critical thinking, problem solving skills, collaborative learning**)

**Review Exercise**

Study the chart and write down 2 patterns 1 increasing and the other one decreasing

**Suggested Home Work**

- Write five terms of pattern in an increasing order. Use your own numbers.
- Write five terms of pattern in a decreasing order. Use your own numbers.

For additional exercises on this module on this module, refer to pages 179 of the Workbook.

Encourage learners to do the reflection exercises on page 240 after this sub-strand.

Learners complete the self-assessment table on page 240. This will help you know each learner's strength and weaknesses.



**3**

**Strand:**

**Geometry and  
measurement**

## Module 1: Describing solid shapes

## Content Standard

**B3.3.1.1:** Analyse the relationships among and between 2-D shapes and 3-D objects according to a variety of attributes, including measurement.

## Indicator

**B3.3.1.1.1:** Describe 3D objects according to the shape of the faces, the number of edges and vertices. Sort regular and irregular polygons including triangles, quadrilaterals, pentagons, heptagons according to the number of sides.

## Learning Expectation

Learners will be able to recognize and name solid shapes and describe 3D objects using their attributes.

## Essential for Learning:

Learners can identify 3D objects and 2D shapes.

## New Words

2-D shapes, 3-D shapes, faces, edges, vertices

## Resources

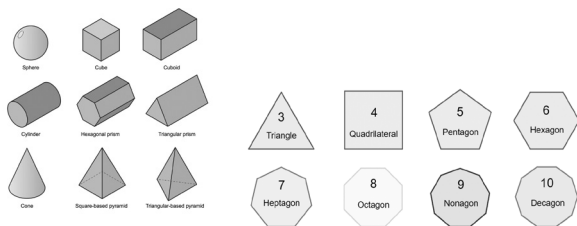
sheets of paper, cardboard, colour pencil, 3D objects, pictures of 3D objects, etc.

Number of Lessons 4

## Lesson 1: Describing solid shapes

## Starter

Play: Treasure hunt... (shapes, 3D objects)  
Show learners a 2D shape or 3D object.  
Learners must find as many examples of the shape or object in the classroom (or in the school yard) that looks like the 2D shape or 3D objects you showed to them.



3D objects

2D shapes

## Find Out

Direct learners to page 242 of the Learner's Book.

Say: Look at the shapes. Can you identify and name these shapes? Can you talk about their attributes?

## Let us Learn

- Direct learners to **Let us Learn** on page 242 of the Learner's Book.  
Point to the solid shapes and drill the names with them.

- Lead learners to talk about objects in the classroom and their homes that look like any of the 3D objects. Examples, door, bottle, ball, funnel, etc.
- Pair learners and task them to draw any real objects that look like 3D objects.  
*(Critical thinking, collaborative learning)*

## Review

## Differentiated lesson

## Low ability learners

- Present learners with 3D objects to identify their names.

## High ability learners

- Task learners to differentiate among 2D shapes found in the 3D objects.

## Assessment for Learning

Refer learners to Exercise 1 on pages 243 and 244 of the Learner's Book.



## Lesson 2: Attributes of a cylinder, a cube and a cuboid

### Starter

Learners count in 10s from 10 up to 100.

### Let us learn

- Put learners into groups of six.  
Give each group a cylinder, a cube and a cuboid and some criteria to use to talk about the objects.
  - Task each group to make presentation on their 3Ds to the class using the criteria below.
- Criteria**
- Name
  - Flat face/curved face
  - Number of faces
  - Number of edges
  - Number of vertices
- Encourage other learners to ask questions.
  - Task each group to cut the nets to make their own cylinder, cube and cuboid.  
*(Collaborative learning, Justification of Ideas)*

### Review

### Differentiated lesson

#### Low ability learners

- Present learners with a cylinder, a cube and a cuboid and some criteria to describe them. Learners also identify objects that are considered cylinders, cubes or cuboid in the environment.

#### High ability learners

- Task learners to identify 2D shapes found in the cylinder, cube and cuboid and describe the cube using some given criteria.

### Assessment for Learning

Refer learners to Exercise 2 on page 244 of the Learner's Book.

## Lesson 3: Attributes of a sphere and a cone

### Starter

Learners count in 10s from 10 up to 100.

### Let us learn

- Use learners' group from previous lesson. Give each group a sphere and a cone and some criteria to use to talk about the object.  
Task each group to make presentation on their objects to the class using the criteria.
- Criteria**
- Name
  - Flat face/curved face
  - Number of faces
  - Number of edges
  - Number of vertices
- Encourage other learners to ask questions.
  - Demonstrate how to cut the net of a sphere and a cone.
  - Task each group to cut the net to make their own sphere and cone. *(Collaborative learning, Justification of Ideas)*

### Review

### Differentiated lesson

#### Low ability learners

Present learners with a sphere and a cone and criteria to describe them. Learners also identify objects that are considered spheres and cones in the environment. Examples of sphere: ball, orange, egg, etc. Examples of cone: funnel, ant lions hole, etc.

#### High ability learners

Task learners to identify the 2D shapes found in a sphere and a cone and describe them using some given criteria.

### Assessment for Learning

Refer learners to page 245 of the Learner's Book for exercise.

## Lesson 4: Attributes of a triangular pyramid and rectangular prism

### Starter

Learners count by 10s from 10 up to 100.

### Let us learn

- Use learners' group from previous lesson. Give each group a triangular pyramid and

rectangular prism and some criteria to use to talk about the object.

- Task each group to make a presentation on their objects to the class using the criteria.

#### Criteria

- Name
  - Flat face/curved face
  - Number of faces
  - Number of edges
  - Number of vertices
- Encourage other learners to ask questions.
  - Demonstrate how to cut the net of a triangular pyramid and rectangular prism.
  - Task each group to cut the net to make their own triangular pyramid and rectangular prism. (**Collaborative learning, Justification of Ideas**)

#### Review

#### Differentiated lesson

##### Low ability learners

- Present learners with a triangular pyramid and rectangular prism and criteria to describe it. Learners also identify objects that are considered sphere in the environment.

#### High ability learners

- Task learners to identify the 2D shapes found in a triangular pyramid and rectangular prism and describe them using some given criteria.

#### Assessment for Learning

1. Draw and colour a triangular pyramid and a rectangular prism and name them.

#### Suggested Homework

1. Draw any two objects that have the shape of a sphere.
2. Write any two objects that have a rectangular shape.

3. Use these criteria to describe the following 3D objects

Criteria	Cone	Cylinder	Sphere	Cuboid	Cube	Triangular pyramid	Rectangular prism
1. Corners							
2. Faces							
3. Roll/not roll							
4. number of edges							
5. number of vertices							

Write three examples of real objects for each of the 3Ds in the table.

	Sphere	cylinder	cuboid	Cube
Objects	E.g. ball			

For additional exercises on this module, refer to pages 182 - 184 of the Workbook.

## Module 2: Regular and irregular shapes

## Content Standard

**B3.3.1.1:** Analyse the relationships among and between 2-D shapes and 3-D objects according to a variety of attributes, including measurement.

## Indicator

**B3.3.1.1.1:** Describe 3D objects according to the shape of the faces, the number of edges and vertices. Sort regular and irregular polygons including triangles, quadrilaterals, pentagons, heptagons according to the number of sides.

## Learning Expectation

Learners will be able to Identify irregular shapes and differentiate between regular and irregular shapes.

## Essential for Learning

Learners can identifying 3D objects and 2D shapes.

## New Words

regular, irregular, angles, sides



**Resources:** sheets of paper, cardboard, colour pencil, cut out regular and irregular shapes

Number of Lessons 2

## Lesson 1: Regular and irregular shapes (1)

## Starter

Play: "What can you say about the shape" (2D shapes or 3D objects)

Raise up any 2D shape (  ) or a 3D object (  ).

Say "What can you tell me about this shape or object?"

Learners must say everything they know about the shape or object. They can share ideas.  
(*Critical thinking, collaborative learning*)

## Find Out

Direct learners to page 246 of the Learner's Book.

Say: Look at the following shapes. Can you describe them using their faces, edges and vertices?

## Let us learn

- Put learners into convenient groups. Direct them to **Let us learn** on pages 246 and 247 of the Learner's Book.
- Task each group to brainstorm to come out with the meaning of regular and irregular shapes.

Explain to them that, regular shapes are 2D shapes with all sides and angles equal. Irregular shapes do not have equal sides or equal angles.

- Show examples of regular and irregular shapes to help learners understand the meaning well.
- Raise cut out shapes. Some being regular and others being irregular for learners to identify them. (*Collaborative learning, Justification of Ideas*)

## Review

- Show learners some regular and irregular shapes for them to identify.
- Learners tell the difference between regular and irregular shapes.



## Assessment for Learning

Refer learners to page 247 of the Learner's Book for exercise.

## Lesson 2: Regular and irregular shapes

### Starter

Play: "What can you say about the shape" (2D shapes or 3D objects)

Raise up any 2D shape (  ) or a 3D object (  ).

Say "What can you tell me about this shape or object?"

Learners must say everything they know about the shape or object. They can share ideas.  
(*Critical thinking, collaborative learning*)

### Let us learn

- Review previous lesson on regular and irregular shapes.
- Put learners into groups of about six.  
Give each group sheets of paper.  
Task them to make regular and irregular shapes.
- Take learners outside the class to identify objects they consider as having regular shapes and those with irregular shapes.

### Review

- Learners identify regular and irregular shapes in the classroom.
- Learners draw regular and irregular shapes and compare them. (*Critical thinking, collaborative learning*)

### Assessment for Learning

Refer learners to page 248 of the Learner's book for exercise.

### Suggested Homework

1. Learners are to draw two regular and irregular shapes, colour them and cut them out.

For additional exercises on this module, refer to pages 185 - 187 of the Workbook.

## Module 3: Angles

**Content Standard**

**B3.3.1.1:** Analyze the relationships among and between 2-D shapes and 3-D objects according to a variety of attributes, including measurement

**Indicator**

**B3.3.1.1.2:** Draw and identify angles.

**Learning Expectation**

Learners will be able to identify angles in shapes and draw them.

**Essential for Learning**

Learners can identify 3D objects and 2D shapes and draw them.

**New Words**

Angles, trapezium, kite, irregular

**Resources**



Sheets of paper, ruler, pencil, colour pencil, cut out regular and irregular shapes.

Number of Lessons **2**

## Lesson 1: Angles (1)

**Starter**

Play: "What can you say about the shape" (2D shapes or 3D objects)

Raise up any 2D shape (  ) or a 3D object (  ).

Say "What can you tell me about this shape or object?"

Learners must say everything they know about the shape or object. They can share ideas.

*(Critical thinking, collaborative learning)*

**Find Out**

Direct learners to page 249 of the Learner's Book.

Say: Look at the following shapes. What are these shapes? Can you identify the angles in the shapes?

**Let us learn**

- Put learners into sizeable groups.
- Give each group a pencil and a sheet of paper.  
Task them to draw two intersecting lines and observe what they see.
- Brainstorm on the meaning of an angle with learners. Explain to them that an angle is formed when two lines meet.

- Take learners out of the classroom to identify angles in some real objects.
- Direct learners to **Let us learn** on pages 249 and 250 of the Learner's Book.  
*(Critical thinking, collaborative learning)*

**Review**

- Show cut out of regular and irregular shapes to learners. They identify the angles in them.



**Assessment for Learning**

Refer learners to page 250 of the Learner's Book for exercise.

## Lesson 2: Angles (2)

**Starter**

Play: "What can you say about the shape" (2D shapes or 3D objects)

Raise up any 2D shape (  ) or a 3D object (  ).

Say "What can you tell me about this shape or object?"

Learners must say everything they know about the shape or object. They can share ideas.

*(Critical thinking, collaborative learning)*

**Let us learn**

- Revise previous lesson on angles.
- Put learners into convenient groups. Present them with drawings of the various plane shapes on sheets of paper. Discuss the number of angles in the shapes. Explain that a square and a rectangle both have four angles. A triangle has three angles.
- Discuss angles with equal and unequal angles. Some shapes have all angles equal. For example; square, rectangle, equilateral triangle, etc. Some shapes have unequal angles. Example; trapezium, kite, and all irregular shapes. (**Critical thinking, collaborative learning**)
- Put learners into groups. Present them with tables to complete and present their results to the class.

Shapes	Number of angles	Equal or unequal angles
Square		
Rectangle		
Triangle		
Hexagon		
Kite		
Rhombus		

**Review**

- Draw a square, kite and rhombus on the board. Learners identify the number of angles in them and tell whether they are equal or unequal.

**Assessment for Learning**

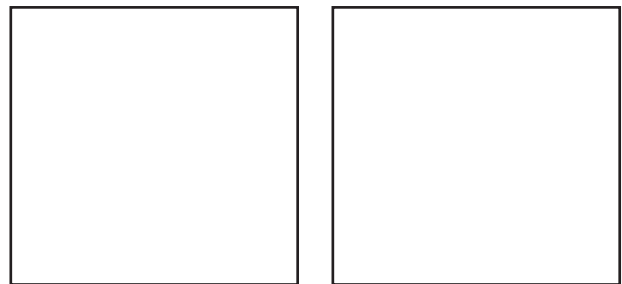
Refer learners to page 251 of the Learner's Book for exercise

**Suggested homework**

1) Complete the table.

Shapes	Number of angles	Equal or unequal angles
Square		
Rectangle		
Triangle		
Hexagon		
Kite		
Rhombus		

2) Draw two shapes of your choice and identify the angles in them.



For additional exercises on this module, refer to pages 188 - 189 of the Workbook



**Module 4:** Angles that are right angles**Content Standard:**

**B3.3.1.1:** Analyze the relationships among and between 2-D shapes and 3-D objects according to a variety of attributes, including measurement

**Indicator:**

**1 B3.3.1.1.3:** Use cut-out paper as a square corner to determine angles which are right angles and angles which are not right angles  
**2. B3.3.1.1.4** Use attributes to recognize rhombuses, parallelograms, trapezoids, rectangles, and squares as examples of quadrilaterals and draw examples of quadrilaterals that do not belong to any of these subcategories

**Learning Expectation**

Learners will be able to identify angles that are right angles and those that are not and make right angles using paper cut-outs.

**Essential for Learning**

Learners can identify angles in 3D objects and 2D shapes.

**New Words:** Angles, right angles.

**Resources:** Sheets of paper, ruler, colour pencil, cut out regular and irregular shapes.

Number of Lessons **2**

**Lesson 1:** Angles that are right angles (1)**Starter**

Play: "Who am I? (whole class activity for identifying 2D or 3D objects by their features)

Draw shapes on the board (triangles, squares, rectangles, circles) or a collection of 3D objects in front of learners.

Give learners simple clues. Example:

I have pointed corners, I have 3 sides and angles - Who am I?. Etc.

Learners have to identify 2D shapes or 3D objects. (**Critical thinking**)

**Find Out**

Direct learners to page 252 of the Learner's Book.

Say: Look at the following angles. What can you say about the two angles?

**Let us learn**

- Revise previous lessons on angles with learners.
- Use cut-out paper as a square corner to demonstrate angles which are right angles and angles which are not right angles to learners.

- Pair learners and task them to use paper cut out to make right angles.
- Brainstorm on the meaning of a right angle. Explain to learners that right angles are angles that are formed by two perpendicular lines. They make angle  $90^\circ$ . (**Critical thinking, collaborative learning**)
- Direct learners to the **Let us Learn** on page 252 of the Learner's Book.

**Review Exercise**

- Learners identify angles that are right angles and those that are not in the classroom.

**Assessment for Learning**

Refer learners to page 253 of the Learner's Book for exercise.

## Lesson 2: Angles that are right angles (2)

### Starter

Play: "Who am I? (whole class activity for identifying 2D or 3D objects by their features)

Draw shapes on the board (triangles, squares, rectangles, circles) or a collection of 3D objects in front of learners.

Give learners simple clues. Example:

I have pointed corners, I have 3 sides and angles - Who am I?. Etc.

Learners have to identify 2D shapes or 3D objects. (**Critical thinking**)

### Let us learn

- Revise previous lessons on right angles with learners.  
Take learners outside of the class to identify right angles in real objects.
- Put learners into groups of four. Give each group a sheet of paper.  
Demonstrate how to make square corners with paper.  
Guide learners to make their own square corners. They move around the classroom, use their square corners to identify objects

that are right angle and those that are not. Example, exercise books, text books, corners of tables and chairs, corners of the classroom, etc. (**Critical thinking, collaborative learning**)

- Task learners to draw shapes that have right angles.

### Review Exercise

- Ask the learners, in their groups, to list the items they identified with their square corners. They state those that are right angles and those that are not.
- They should present their findings to the whole class.

### Assessment for Learning

Refer learners to page 254 of the Learner's Book for exercise

### Suggested Homework

Draw any two real objects and show the right angles in it

For additional exercises on this module, refer to pages 190 - 191 of the Workbook

## Module 5: Quadrilaterals

**Content Standard**

**B3.3.1.1:** Analyze the relationships among and between 2-D shapes and 3-D objects according to a variety of attributes, including measurement

**Indicator:**

1. **B3.3.1.1.3** Use cut-out paper as a square corner to determine angles which are right angles and angles which are not right angles
2. **B3.3.1.1.4** Use attributes to recognize rhombuses, parallelograms, trapezoids, rectangles, and squares as examples of quadrilaterals and draw examples of quadrilaterals that do not belong to any of these subcategories

**Learning Expectation:**

Learners will be able to identify and draw shapes that are considered quadrilaterals.

**Essential for Learning**

Learners can identify 2D shapes and 3D objects.

**New Words**

Quadrilaterals, four – sided, figure, parallel.

**Resources**

Sheets of paper, ruler, colour pencil, drawings of quadrilaterals and non-quadrilaterals.

Number of Lessons **2**

## Lesson 1: Quadrilaterals (1)

**Starter**

Play: "Who am I? (whole class activity for identifying 2D or 3D objects by their features)

Draw shapes on the board (triangles, squares, rectangles, circles) or a collection of 3D objects in front of learners.

Give learners simple clues. Example:

I have pointed corners, I have 3 sides and angles - Who am I?. Etc.

Learners have to identify 2D shapes or 3D objects. (**Critical thinking**)

**Find Out**

Direct learners to page 255 of Learner's Book. Say: look at the following shapes. What can you say about them?

**Let Us Learn**

- Put learners into convenient groups. Brainstorm on the meaning of quadrilaterals with them. Explain to learners that Parallelograms are four sided figures with opposite sides parallel and equal.

- Present to the groups, task sheet containing quadrilaterals and non-quadrilaterals.
- Task learners to sort out the shapes into quadrilaterals and non-quadrilaterals in their groups. (**Critical thinking, collaborative learning**) Task each group to present their findings to the class. They should justify their results by talking about them. (**Communication skills, leadership**)
- Direct learners to **Let us learn** on page 255 of the Learner's Book.

**Review Exercise****Differentiated lesson****Low ability learners**

- Give out different shapes to learners. Task them to sort out the shapes into quadrilaterals and non-quadrilaterals. They can work in pairs.

**High ability learners**

- Task Learners to draw four quadrilaterals and two non-quadrilateral shapes. They should justify their drawings.

**Assessment for Learning**

Refer learners to page 256 of the Learner's Book for exercise.

## Lesson 2: Quadrilaterals (2)

### Starter

Play: "Who am I? (whole class activity for identifying 2D or 3D objects by their features)

Draw shapes on the board (triangles, squares, rectangles, circles) or a collection of 3D objects in front of learners.

Give learners simple clues. Example:

I have pointed corners, I have 3 sides and angles - Who am I?. Etc.

Learners have to identify 2D shapes or 3D objects. (**Critical thinking**)

### Let us learn

- Revise previous lesson on quadrilaterals with learners.
- Put learners into groups of four or five. Learners go round the classroom to identify items that are quadrilaterals. They also use their square corners to find items that are quadrilaterals with right angles in the classroom.
- Take learners outside the classroom to observe and identify things in the environment that can be considered as quadrilaterals.
- Back to the classroom, ask each group to present the things they identified in both the classroom and outside the classroom that are quadrilaterals. (**Critical thinking, communication skills, leadership**)
- Still in their groups, task them to draw quadrilaterals and non-quadrilaterals and colour them.

- Refer learners to **Let us learn** on page 255 of the Learner's Book. Go through the activities with learners.

### Review Exercise

### Differentiated lesson

#### Low ability learners

- Learners draw 2 quadrilaterals and 2 non-quadrilaterals.

#### High ability learners

- Learners draw 2 quadrilaterals and 2 non-quadrilaterals.
- They write this under each one and complete the sentence.  
This is a \_\_\_\_\_ because this shape has \_\_\_\_\_.

### Assessment for Learning

Refer learners to page 257 of the Learner's Book for exercise.

### Suggested homework

Draw three quadrilaterals and two non-quadrilaterals

For additional exercises on this module, refer to pages 192 - 194 of the Workbook

Encourage learners to do the reflection exercises on page 258 after this sub-strand.

Learners complete the self-assessment table on page 259. This will help you know each learner's strength and weaknesses.

## Module 1: Positioning of objects

**Content Standard**

**B3.3.2.1** Demonstrate that the length of an object does not change with its placement or direction.

**Indicator**

**B3.3.2.1.1** Represent whole numbers as distances from any given location on a number line.

**Learning Expectation:**

Learners will be able to identify that the length of an object does not change irrespective of its position/location.

**Essential for Learning**

Learners can identify regular and irregular shapes and draw them.

**New Words**

Position, length, location.

**Resources**

Water bottles, crayons, pencils, sticks, pictures/cut outs of 2D shapes in different orientations, number line cards.

Number of Lessons **2**

## Lesson 1: Positioning (1)

**Starter**

Play: Which is smaller or larger? (Whole class, pair or individual activity to develop Understanding of relationships between quantities or numbers.

Write two numbers on the board.

Learners work with a partner to identify and prove (using counters or other means) which of the two numbers is smaller or larger.

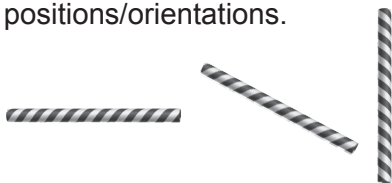
**Find Out**

Direct learners to page 260 of the Learner's Book.

Say: Look at the shapes carefully. What can you say about them? Are they of the same height? Is any of them the longest? Why do you say so?

**Let us learn**

- Using two straws of the same height, demonstrate to learners that the heights of the straws are the same even in different positions/orientations.



Learners in pairs repeat the above demonstration. They can use different objects. (**Collaborative learning**)

- Put learners into small groups of about five or seven.  
Present them with drawings of different 2D shapes in different orientations. Examples, triangles, rhombus, triangles, etc.  
Task learners to identify shapes that are the same but in different positions.  
(**Critical thinking, collaborative learning**)

**Review Exercise**

- Give 2D cut out shapes and sheet of papers to learners in pairs. They trace around the same shape in different positions.
- Let them tell you what they observe.

**Assessment for Learning**

Refer learners to Exercise 2 on page 262 of the Learner's Book.

## Lesson 2: Positioning (2)

**Starter**

Play: Which is smaller or larger? (Whole class, pair or individual activity to develop Understanding of relationships between quantities or numbers.

Write 2 numbers on board.

Learners work with a partner to identify and prove (using counters or other means) which of the two numbers is smaller or larger.

**Find Out**

Direct learners to page 260 of the Learner's Book.

Say: Look at the shapes carefully. What can you say about them? Are they of the same height? Is any of them the longest? Why do you say so?

**Let us learn:**

- Revise previous lesson on position of objects with learners.
- Draw a number line on the board. Demonstrate to learners how we can show that the length of an item does not change irrespective of its position on the number line. Example, place a stick on the number line. Learners count the numbers to find the length of the stick. Change the position of the stick and learners count again to find the length.

Let them tell you what they observed.

- Pair learners. Give each group a number line card, pencil, crayon, stick and cut out shapes.

Task them to place the pencil on the number line card. They read the numbers to find the length. They should change the position of the pencil and count the numbers again to find the length of the pencil.

They should repeat the activity with different objects. (**Critical thinking, collaborative learning**)

- Refer learners to **Let us learn** on page 260 of the Learner's Book. Go through the activities with learners.

**Review Exercise**

- Give out cut out shapes, pencils, crayons, sticks, etc to learners. Each learner should trace around the item he/she got, in four different positions.
- They use the number line cards to check the length of all the traced images.
- Let them tell each other what they observed. (**Critical thinking, collaborative learning**)

**Assessment for Learning**

Refer learners to page 261 of the Learner's Book for exercise

For additional exercises on this module, refer to pages 195 - 196 of the Workbook

Encourage learners to do the reflection exercises on page 263 after this sub-strand.

Learners complete the self-assessment table on page 263. This will help you know each learner's strength and weaknesses.



**Module 1:** Measurement of length**Content Standard**

**B3.3.3.1:** Demonstrate an understanding of a metre and centimetre (cm, m) units for measuring length

**Indicator**

**B3.3.3.1.1:** Model and describe the relationship between the units metre and centimeter.

**Learning Expectation**

Learners will be able to measure length of objects in centimetres.

**Essential for Learning**

Learners can find the length of an object, irrespective of the position.

**New Words**

Length, meter, centimeter.

**Resources**

Ruler, pencils, paper clips, straws, colour pencils etc.

Number of Lessons **2**

**Lesson 1:** Measurement of length using a cm rule (1)**Starter**

Play: "Doubles"

Call out a number between 0 and 5, for example 4.

Learners must call out the double (2x) of that number, in this case, double of 4 is 8.

The aim of the game is to develop speed-so move quickly from one number to the other.

**Find Out**

Direct learners to **Find out** on page 264 of the Learner's Book.

Say: Look at the illustration. How many paper clips would make up the pencil? If one paper clip is 1cm, how many centimeters will the pencil measure?

**Let us Learn**

- Put learners into groups of about five. Give each group a measuring rule. Task the groups to discuss the features of the ruler.
- Demonstrate how to measure the length of objects correctly, using a measuring rule. Explain to learners that to measure accurately, put the zero (0) mark at the very tip of the object and read the number of units in the length of the objects.
- Pair learners and assign them to measure

a given length. (*Collaborative learning*)

- Refer learners to **Let us learn** on page 264 of the Learner's Book. Go through the activities with them.

**Review****Differentiated lesson****Low ability learners**

- Learners to measure the length of their desk using a ruler.

**High ability learners**

- Learners to measure the length of the teachers table using a ruler.

**Assessment for Learning**

Refer learners to Exercise 1 on page 265 of the Learner's Book.

**Lesson 2:** Measurement of length using a cm rule (2)**Starter**

Play: "Doubles"

Call out a number between 0 and 5, for example 4.

Learners must call out the double (2x) of that number, in this case, double of 4 is 8.

The aim of the game is to develop speed-so move quickly from one number to the other.

**Find Out**

Direct learners to **Find out** on page 264 of the Learner's Book.

Say: Look at the illustration. How many paper clips would make up the pencil? If one paper clip is 1cm, how many centimeters will the pencil measure?

**Let us Learn**

- Review the activity on the appropriate use of ruler with learners.
- Put learners into groups of about five. Give each group a measuring rule and some items like exercise book, pencil, straws, etc. Task learners to measure the length of the items and record the results.
- Allow groups time to present their results to class. (**Collaborative learning**)
- Refer learners to **Let us learn** on page 264 of the Learner's Book. Go through the activities with them.

**Review****Differentiated lesson****Low Ability Learners**

- Learners to measure a given length using a ruler. Example, exercise book.

**High Ability Learners**

- Learners to measure a given length using a ruler. Example, the length of the board.

**Assessment for Learning**

Refer learners to page 266 of the Learner's Book for exercise

**Suggested homework**

- 1) Draw lines to show the following lengths:
  - a. 3cm
  - b. 5cm
  - c. 8cm
  - d. 12cm
  - e. 15cm
- 2) Measure the length of any five items at home and record the results. Learners are to compare their answers with their friends during the next lesson.

For additional exercises on this module, refer to pages 197 - 198 of the Workbook

**Module 2:** Measurement of length (relationship between cm and m)**Content Standard**

**B3.3.3.1:** Demonstrate an understanding of a metre and centimetre (cm, m) units for measuring length

**Indicator**

**B3.3.3.1.1:** Model and describe the relationship between the units metre and centimetre.

**Learning Expectation**

Learners will be able to measure length of objects in metres.

**Essential for Learning**

Learners can measure the lengths of objects using a ruler.

**New Words**

Length, meter, centimeter

**Resources**

Ruler, pencils, paper clips, straws, colour pencils etc.

Number of Lessons **2****Lesson 1:** Measurement of length using the metre rule (1)**Starter**

Play: "Doubles"

Call out a number between 6 and 10, for example 8.

Learners must call out the double (2x) of that number, in this case, double of 8 is 16.

The aim of the game is to develop speed-so move quickly from one number to the other

**Find Out**

Direct learners to **Find out** on page 267 of Learner's Book.

Say: look at the picture carefully. How many of your ruler can measure the length of the piece of land? Can we use another measuring instrument to measure? How many centimetres will make the length? Can we measure in a different unit? (**Critical thinking**)

**Let us Learn**

- Review the previous lesson on measuring length with a cm rule with learners.
- Discuss the picture in **Find out** with the class. Explain to them that sometimes the length of the objects we measure are too large. So, we cannot measure it in centimeters.
- Put learners into groups of about five. Give each group a centimetre rule and a metre rule.

Task the groups to measure and mark 100cm on the floor using a cm rule. They then measure the 100cm mark using a 1 metre rule.

Let each group discuss their observation and present it to the class. (**Collaborative learning, critical thinking**)

- Brainstorm with learners to come out with the concept that 100cm = 1m.
- Task learners to measure 2metres and mark it. Then measure the marked length in cm. They should tell the class what length they get in cm. Help learners to realize that every 100cm is 1m.
- Refer learners to **Let us learn** on pages 267 and 268 of the Learner's Book. Go through the activities with them.

**Review****Differentiated lesson****Low ability learners**

- Let learners measure the length of the teachers table in cm and m and record their findings.

**High ability learners**

- Learners to convert cm into m without measuring and vice versa.

**Assessment**

Refer learners to Exercise 1 on page 268 of the Learner's Book.

## Lesson 2: Measurement of length using the metre rule (2)

### Starter

Play: “Doubles”

Call out a number between 6 and 10, for example 8.

Learners must call out the double (2x) of that number, in this case, double of 8 is 16.

The aim of the game is to develop speed, so move quickly from one number to the other.

### Find Out

Direct learners to **Find out** on page 267 of Learner's Book.

Say: look at the picture carefully. How many of your ruler can measure the length of the piece of land? Can we use another measuring instrument to measure? How many centimeters will make the length? Can we measure in a different unit? (**Critical thinking**)

### Let us Learn

- Review the lesson on measurement of length using a cm rule with learners.
- Put learners into groups of about five.
- Give each group a metre rule and a centimetre rule.
- Assign them some items to measure in metres and then in centimetres and compare the results. Examples:  
The length of the varendar.  
The length of the classroom.  
The length of the window.  
The length of the door. etc.

- Discuss the examples on conversion of cm to m with learners. Refer to the top part of page 268 of the Learner's Book.
- Pair learners and give them some examples to try. (**Critical thinking, Collaborative learning**)

### Review

#### Differentiated lesson

##### Low ability learners

- Learners to convert m to cm and vice versa by measuring.

##### High ability learners

- Learners to convert m to cm and vice versa without measuring.

#### Assessment for Learning

Refer learners to Exercise 2 on page 268 of the Learner's Book.

For additional exercises on this module, refer to pages 199 - 200 of the Workbook.

**Module 3:** Measurement of length (relationship between cm and m)**Content Standard**

**B3.3.3.1:** Demonstrate an understanding of a metre and centimetre (cm, m) units for measuring length

**Indicator**

**B3.3.3.1.2:** Select and justify referents for metre and centimetre

**Learning Expectation**

Learners will be able to measure length of objects in metres.

**Essential for Learning**

Learners can measure the lengths of objects using a ruler.

**New Words**

Length, meter, centimeter

**Resources**

Ruler, colour pencils etc.

Number of Lessons **1****Lesson 1:** Measurement of length in cm and m**Starter**

Play: "Doubles"

Call out a number between 0 and 5, for example 4.

Learners must call out the double (2x) of that number, in this case, double of 4 is 8.

The aim of the game is to develop speed-so move quickly from one number to the other.

**Find Out**

Direct learners to **Find out** on page 269 of the Learner's Book.

Say: Look at the two objects. Can you measure their lengths using your ruler? Can you measure the length of the tennis court in centimetres?

**Let us Learn**

- Review the previous lesson on converting m to cm and vice versa.
- Discuss the picture in **Find out** with the class. Explain to them that we measure the length of large objects in metres. The length of the school compound should not be measured in centimetres because the values will be too large.

- Put learners into groups of about five. Task them to discuss and write items that can be measured in cm and those that can be measured in m. Example of items that can be measured in cm are: books, pencils, tables, chairs, etc. Example of items that can be measured in m are: school compound, football field, length of a wall, etc. (**Critical thinking, collaborative learning**)
- Allow groups time to present their result and justify their results. (**Justification of ideas, leadership skills**)
- Refer learners to **Let us learn** on page 269 of the Learner's Book. Go through activities with them.

**Review**

- Learners name items that can be measured in cm and those that can be measured in m.

**Assessment of Learning**

Refer learners to page 270 of the Learner's Book for exercise.

For additional exercises on this module, refer to pages 201 of the Workbook

## Module 4: Perimeter

**Content Standard**

**B3.3.3.1:** Demonstrate an understanding of a metre and centimetre (cm, m) units for measuring length

**Indicator**

**B3.3.3.1.3:** Estimate lengths, heights and perimeter of regular and irregular shapes using referents and verify by measuring, using a ruler or tape.

**Learning Expectation**

Learners will be able to estimate the

perimeter of shapes and verify by measuring.  
**Essential for Learning**

Learners can measure in metre and centimetre (cm, m).

**New Words**

estimate, lengths, heights, perimeter, regular, irregular

**Resources**

ruler, tiles, exercise books, colour pencils etc.

Number of Lessons **2**

### Lesson 1: Perimeter of regular shapes

**Starter**

Play: Guess my number (whole class activity)  
Give learners hints about a number. E.g: It has a 3 in the tens place...the number in the ones place is smaller than 4.  
Learners must look and identify possible number, based on clues. Allow learners to look at number line to find answer.



30 31 32 33 34 35 36 37

**Find Out**

Direct learners to **Find out** on page 271 of the Learner's Book.

Say: Look at the two objects. Can you measure their lengths using your ruler? Can you measure the length of the tennis court in centimetres?

**Let Us Learn**

- Review the previous lesson on measuring lengths in cm and m with learners.
- Brainstorm to bring out the meaning of perimeter. Explain that to measure the perimeter of shapes, we first measure the lengths of all the sides and sum them.
- Demonstrate how the perimeter of an exercise book or the top of a learner's table can be measured. Before they measure,

guide them to estimate first.

- Put learners into groups. Assign each group an item and task them to measure its perimeter. Let them estimate the perimeter of the item first.
- Call out groups to present their results with reasons and justify them. (**Justification of ideas, collaborative learning**)
- Call out some learners to present their answers on the board and explain them.
- Refer learners to **Let us learn** on pages 271 and 272 of the Learner's Book. Go through the activities with them.

**Review Exercise****Differentiated lesson****Low ability learners**

- Learners measure the perimeter of items. Example, exercise books.

**High ability learners**

- Learners measure the perimeter of items. Example, tables and chairs.

**Assessment**

Refer learners to Exercise 1 on page 272 of the Learner's Book.

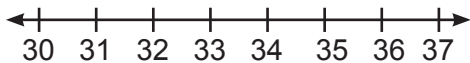


## Lesson 2: Perimeter of irregular shapes

### Starter

Play: Guess my number (whole class activity)  
Give learners hints about a number. E.g: It has a 3 in the tens place...the number in the ones place is smaller than 4.

Learners must look and identify possible number, based on clues. Allow learners to look at number line to find answer.



### Let Us Learn

- Review the previous lesson on measuring perimeter of regular shapes with learners.
- Have learners brainstorm to come out with the meaning of irregular shape, that is a shape that has different sides and angles.
- Direct learners to **Let us Learn** on page 271 of the Learner's Book. Let them identify the irregular shape among the shapes.  
Direct learners to estimate the perimeter in cm of the irregular shape. They then measure and compare with their estimate to check how close/far they were.
- Discuss and demonstrate how to calculate the perimeter of a given irregular shape.

- Put learners into convenient groups and assign them some examples of irregular shapes to work out the perimeter.
- Call out some learners to present their answers on the board and explain their answers. (**Justification of ideas, collaborative learning, critical thinking**)

### Review Exercise

#### Differentiated lesson

##### Low ability learners

- Task learners to identify three objects that have irregular shapes in the classroom and measure to find the perimeter.

##### High ability learners

- Learners draw their own irregular shapes and measure the perimeter.

#### Assessment for Learning

Refer learners to page 273 of the Learner's Book for exercise.

For additional exercises on this module, refer to pages 202 - 204 of the Workbook

## Module 5: Measurement of mass (relationship between kilogram and gram; litres and millilitres)

### Content Standard

**B3.3.3.2:** Demonstrate an understanding of kilogram and gram (Kg, g) unit for measuring mass and millilitre and litre (ml, l) for measuring capacity.

### Indicator

**B3.3.3.2.1:** Model and describe the relationship between the units Kilogram and gram as well as litres and millilitres.

### Learning Expectation

Learners will be able to measure the mass of objects in grams and kilograms; measure the capacity of objects in litres and millilitres.

### Essential for Learning

Learners can compare and order the mass of objects.

### New Words

Kilogram, gram, litres, millilitres.

### Resources

Pencils, a bag of soil, a mug, a bottle of water (1litre and 500ml bottles), milo tin filled with wet sand, weighing scale, kilogram scale, big bowl, empty milo and milk tins, calibrated container, etc.

Number of Lessons **2**

## Lesson 1: Measuring mass (relationship between grams and kilograms)

### Starter

Play: "Race to 100".

Have learners put 10 bundles of 10s and 10 ones on their desk, as their place value mats.

Call out a number between 1 and 10, for example 6. Learners must put that many sticks or straws on their place value mat.

Call out another number between 1 and 10. Learners must add that number of sticks or straws to the sticks or straws on their place value mat. If they end up with more than 9 ones, they bundle in the 10s place.

Continue calling out numbers for learners to add to their mat until they end up with 99 on their mat.

### Find Out

Direct learners to "**Find out**" on page 274 of the Learner's Book.

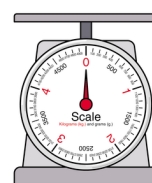
Say: look at the picture carefully. Which pair is heavier?

### Let Us Learn

- Put learners into convenient groups. Give them 1 kilogram weight, milo tin filled with wet sand (equals 1 Kg) and objects that weigh less, same or more than 1 Kilogram. Let each group compare the items with the kilogram weight and find those that weighs 1Kg or less or more.
- Let each group select a leader to present their findings to the class in a presentation.

*(Justification of ideas, collaborative learning, critical thinking, leadership skills, communication skills, attention to precision)*

- Explain to learners that we measure the mass of items in grams and kilograms. We use grams for items that do not weigh much. Like a satchet of rice, exercise book, an apple, school bag, etc. We measure a bag of cement, a bag of rice, cement blocks, etc. in Kilograms.
- Direct learners to **Let us learn: 1 (1)** on page 274 of the Learner's Book. Go through the activity with them.
- Introduce the weighing scale to learners by showing them the calibration marks. The markings are in grams and kilograms.
- Brainstorm and discuss the relationship between grams and kilograms. Explain that  $1000g = 1Kg$ . Therefore  $500g = \frac{1}{2} Kg$  and  $250g = \frac{1}{4} Kg$ .



- Now, demonstrate how to weigh different objects and record their weights in Grams and Kilograms. Let the learners estimate the weights of each item first.
- In their groups, task learners to measure the mass of items using the scale. Let them always estimate first, before they weigh. Learners record their results for class presentation. *(Justification of ideas, collaborative learning, critical thinking, leadership skills, communication skills, attention to precision)*

- Direct learners to **Let us learn: 1 (2)** on page 275 of the Learner's Book. Go through the activity with them.

### Review Exercise

- Learners measure mass of given items using scale.
- Let learners measure their weights and compare with other learners.

### Assessment for Learning

Refer learners to Exercise 1 and 2 on pages 276 and 278 of the Learner's Book.

## Lesson 2: Measuring volume (relationship between litres and millilitres)

### Starter

Play: "Guess my number". It's a multiple of 10, more than 70 but less than 90. Who am I?

### Let us learn

- Use learners previous groups. Give each group 1 litre bottle, 500ml bottle, a sachet water, a bowl of water, empty milk and Milo tins, a big bowl, etc.
- Let them fill the 1 litre bottle with water. They should pour the water in the 1 litre bottle into different containers and find out which containers holds less, same or more than 1 litre.  
Let each group select a leader to present their findings to the class in a presentation.  
**(Justification of ideas, collaborative learning, critical thinking, leadership skills, communication skills, attention to precision)**
- Explain to learners that capacity is the amount of liquid in a container. We measure volume(capacity) in litres and millilitres. We use millilitres for items that has less capacity. Example, spoons, sachet water, tin of milk, etc. We use litres for items that has more capacity. Example, gallons of water, 1 litre bottles of drink, etc.
- Demonstrate how to measure millilitres with a measuring cylinder and litres with measuring containers.
- Put learners into new groups of five and task them to measure volumes of different containers using the measuring cylinder

and measuring container. Learners record their results for class presentation.

- Give learners in their groups, two 500 ml bottles filled with water and one empty 1 litre bottle. They should fill the 1 litre bottle with water from the two 500ml bottles and tell you their observation.  
**(Justification of ideas, collaborative learning, critical thinking, leadership skills, communication skills, attention to precision)**
- Brainstorm and discuss the relationship between litres and millilitres. They should be able to find out that two 500ml bottles fill one 1 litre bottle. So,  $500 \times 2 = 1000$ , therefore,  $1000 \text{ ml} = 1\text{l}$ . Explain that  $1000\text{ml} = 1\text{l}$ .
- Direct learners to **Let us learn: 2** on page 275 of the Learner's Book. Go through the activity with them.
- Give learners different volumes of containers to try and get more understanding on the  $1000 \text{ ml} = 1\text{l}$  relation.

### Review Exercise

- Learners measure volume of containers. Give a litre bottle to learners in their groups. They compare the volumes of other containers using the litre bottle.
- Learners convert the following from ml to l.  
1) 2,400ml                      2) 1,200ml.
- Learners convert the following from l to ml.  
1) 2l                              2) 3l

### Assessment for Learning

Refer learners to Exercise 3 and 4 on pages 277 and 278 of the Learner's Book.

For additional exercises on this module, refer to pages 205 - 206 of the Workbook.

### Suggested homework

1) Complete the table

Item	g/ml	kg/l
1. Rice	-----	1.5kg
2. Gari	5000g	-----
3. A bottle of coke	----- ml	5.5l
4. A tank of turpentine	2500ml	----- l

## Module 6: Estimating mass and volume

**Content Standard**

**B3.3.3.2:** Demonstrate an understanding of kilogram and gram (Kg, g) unit for measuring mass and millilitre and litre (ml, l) for measuring capacity.

**Indicator**

**B3.3.3.2.2:** Estimate masses and volumes using referents and verify by measuring, using a pan balance and weights, calibrated measuring cans.

**Learning Expectation**

Learners will be able to estimate the mass of objects and volumes of substances using direct or indirect comparisons.

**Essential for Learning**

Learners can measure the mass of objects and volume of substances using standard unit of measure.

**New Words**

Estimate, masses, volumes, referents.

**Resources**

Pencils, weighing scale, exercise book, learners book, pineapple, apple, watermelon, a bag of soil, a bowl of water, empty tins, empty bottles, funnel, a mug, a bottle of water (1 and 0.5 litre bottles) etc.

Number of Lessons **2****Lesson 1:** Estimating the mass of objects**Starter**

Play: "Guess how many..." (group activity).

Place a large group of objects in front of the learners, where everyone can see (a collection of pencils, stones, matches, etc.)

Learners are to guess the number of objects, or ask learners to guess how many legs are in the classroom or how many pockets there are in 10 learners clothing or in everyone's clothing.

Write predictions on board then have learners count objects together, out loud. Ask learners who made close estimates to explain the strategy they used.

**Find Out**

Direct learners to **Find out** on page 279 of the Learner's Book.

Say: Look at the picture carefully. Which of the two would weigh more?

**Let Us Learn**

- Call two learners of different weights (fat and very small or slim) in front of the classroom. Let learners guess which of the two is heavier than the other. Write learners response on the board. Call out few learners at random to try lifting the two learners in front of the class. Let

them tell you their observation by asking them to tell you the one they were able to lift easily and the one they couldn't lift.

- Lead the class to take the actual weight of the two learners, using a measuring scale. (*Justification of ideas, collaborative learning, critical thinking, attention to precision*)
- Place the teacher's table and chair in front of the class. Ask learners to estimate the weight of both items. Record their responses on the board. Call learners to lift the chair and table and find out which one weighs more than the other. (*Justification of ideas, critical thinking, attention to precision*)
- Put learners into convenient groups. Task each group to use indirect comparison to compare the weight of the following objects. An apple and a pineapple; an exercise book and learners book; a pineapple and a watermelon. Task each group to select a leader, who presents their findings to the whole class. (*Justification of ideas, collaborative learning, critical thinking, leadership skills, communication skills, attention to precision*)
- In an imaginative discussion, direct learners in their groups to discuss and compare the weights of the following. A car and a bus, a new born baby and an old man, three storey building and single storey building, etc. Each group

should select another leader to present their findings. (*Justification of ideas, collaborative learning, critical thinking, leadership skills, communication skills, attention to precision*)

- Give out the balancing scales to the various groups. Ask them to weigh objects like, apples, bags, learners book, watermelon, etc. and record their weights. Let them estimate first.
- Guide pupils to estimate weights of objects and measure to determine the objects which weigh less or more than the other. (*Justification of ideas, collaborative learning, critical thinking, attention to precision*)
- Direct learners to **Let us Learn: 1** on page 279 of the Learner's Book. Explain to learners that the mass of the big goat could be twice the mass of the small goat. We should be able to estimate the mass of a sheep if we know the mass of the big goat.
- Put learners into convenient groups. Give each group two items of different weights.
- Task learners to first tell which of the two object weighs more. Learners must justify how they figured it out and why they say so.
- Learners must then measure the weight of one of the objects, then estimate that of the other object by comparing it with the one they have measured. (*Collaborative learning, critical thinking, justification of ideas*)

### Review

### Differentiated lesson

#### Low ability learners

- Learners estimate the weight of an orange and watermelon, then they verify by measuring them.

#### High ability learners

- Learners estimate the weight of their friends and then verify by measuring each person.

### Assessment for Learning

Refer learners to Exercise 2 on page 281 and Exercise 4 on page 283 of the Learner's Book.

## Lesson 2: Estimating the volume of containers

### Starter

Play: "Guess how many..." (group activity)

Place a large group of objects in front of the learners, where everyone can see (a collection of pencils, stones, matches, etc.)

Learners are to guess the number of objects, or ask learners to guess how many legs are in the classroom or how many pockets there are in 10 learners clothing or in everyone's clothing.

Write predictions on board then have learners count objects together, out loud. Ask learners who made close estimates to explain the strategy they used.

### Find Out

Show two containers of different capacity to learner.

Say: Look at the two containers. Which of the two would hold more water?

### Let Us Learn

- Display an empty bucket and a bowl(smaller than the bucket) in front of the class. Learners tell you which of the two can hold more and vice versa. Fill the bowl with water and pour it into the bucket. Ask learners to talk about what they noticed. They should be able to recognise that the water in the bowl didnt fill the whole capacity of the bucket.
- Now fill the bucket with water and pour it into the bowl. Let learners look at the level of water in the bowl and bucket and tell you what they observed. The water in the bucket will fill the bowl and there will still be some water left in the bucket. (*Collaborative learning, critical thinking, justification of ideas*)
- Put learners into groups of six. Give each group two containers of different sizes. Example, a milk tin and milo tin; a cup and bottle, etc.
- Task each group to first look at the two containers and estimate which holds more and less than the other. Let them fill one container and pour the water into the other one and discuss their observation. Let them interchange and



repeat the same process. They should observe that, there will be some water left in the bigger container when water is poured from it into the smaller one.

The same way, the water from the small container will not fill the bigger container. There will be some space left.

Invite each group to present their findings to the class. They should say: container "A" hold more than container "B" because ... **(Collaborative learning, critical thinking, justification of ideas, leadership skills)**

- In an imaginative discussion, let learners in their groups discuss and come out with reasons why a barrel can hold more water than a gallon(kuffor gallon). Call each group to present their findings. **(Collaborative learning, critical thinking, justification of ideas, leadership skills)**
- Direct learners to **Let us learn: 2** on page 280 of the learner's book. Explain to learners that five of the small cups will make the large cup. If there is a bigger cup, we can estimate how many of the big cup can fill it.
- Give each group two containers of different sizes (volume). Task learners to first estimate which of the two containers holds more. Learners must justify how they figured it out and why they say so. **(Collaborative learning, critical thinking, justification of ideas)**
- Learners must then measure with the two containers by filling one and pouring the content into the other to verify which of the two containers actually holds more. Lead learners to fill each container with water

and pour it into a calibrated container, to find the exact volume. **(Collaborative learning, critical thinking, justification of ideas)**

- Learners record their results for class presentation.

#### Review Exercise

- Give learners empty 500ml and 1.5litre bottles. Ask them to fill the 1.5litre bottle with water from the 500ml bottle and tell how many times it fills it. They should estimate first.

#### Assessment for Learning

Refer learners to Exercise 1 on page 280 and Exercise 3 on page 282 of the Learner's Book.

#### Suggested homework

- 1) Learners are to select different objects and at home. Compare their weight and record their findings.
- 2) Learners are to compare the capacities of different containers in their kitchen. They list the containers and record their findings.

Learners are to present their records to class the next day.

For additional exercises on this module, refer to pages 207 - 208 of the Workbook



## Module 7: Measurement of time

**Content Standard**

**B3.3.3.3:** Demonstrate an understanding of time taken by events in days, weeks and months.

**Indicator:**

**B3.3.3.3.1:** Use arbitrary units to measure time taken to complete simple events.

**Learning Expectation:**

Learners will be able to estimate and measure the time it takes to complete simple events.

**Essential for Learning**

Learners can differentiate between day time and night time activities.

**New Words**

Time, arbitrary, units, events.

**Resources**

Clock, stop watch, pictures of different activities.

Number of Lessons **2**

## Lesson 1: Measurement of time (1)

**Starter:**

Play: "Find the mystery day (or date)"

Display a calendar for the month or year  
Give learners a start day, for example the 3<sup>rd</sup> of September, as well as a clue, for example the mystery day (or date) is the first Thursday after this date

Learners must find the mystery day (or date) on the calendar.

September 2019						
SUN	MON	TUE	WED	THU	FRI	SAT
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28

**Find Out**

Direct learners to **Find out** on page 284 of the Learner's Book.

Say: Look at the picture.

Ask: Can you tell how many minutes it takes to complete any of the activities?

**Let us Learn**

- Call two learners (a boy and girl) to the front of the classroom. Lead the class to estimate how many minutes it will take for two learners to go to the urinal and headmasters office and back. Ask the boy to walk to the headmasters office and back. Ask the girl to walk to the urinal and back. The remaining learners should find out how many minutes each activity takes. They then tell which of the two activities takes longer time to finish.
- Put the class into three groups. Let the first group sing the national anthem. The second group recites the national pledge. Ask the third group to find out which of the activity takes a shorter or longer time to complete. They should estimate and use the stop watch to find how many minutes each activity took. Rotate the groups until each group takes turn for each activity.  
**(Collaborative learning, attention to precision, justification of ideas)**
- Call groups to take turns to role play a short activity, say: brushing of teeth, while the class time the activity.  
Have a whole class discussion on activities and estimated time it takes to complete those activities.  
Also, discuss some activities that have a standard time that it takes to complete. E.g. School hours, break time, football match, mathematics lesson, science lesson, etc.  
**(Collaborative learning, attention to precision, justification of ideas)**

- Direct learners to **Let us Learn: 1** on page 284 and 285 of the Learner's Book. Discuss the estimated time it takes to complete the activities. E.g. "it takes about 1 and a half hours to play a game of football". But it takes about 6 minutes to brush our teeth.
- Put learners into groups and present each group with a task sheet. Task each group to discuss the activities/ events on the task sheet and estimate the time it takes to complete the activities. Call groups to tell the class what they agreed on. (**Collaborative learning, attention to precision, justification of ideas**)

### Review

#### Differentiated lesson

##### Low ability learners

- Learners tell the estimated time it takes to walk from Basic 1 classroom to Basic 6 classroom.

##### High ability learners

- Learners tell the estimated time it takes to walk round the school building.

#### Assessment for Learning

Refer learners to Exercise 1 and 2 on pages 286 and 287 of the Learner's Book.

## Lesson 2: Measurement of time (2)

### Starter:

Play: "Find the mystery day (or date)"

Display a calendar for the month or year  
Give learners a start day, for example the 3<sup>rd</sup> of September, as well as a clue, for example the mystery day (or date) is the first Thursday after this date

Learners must find the mystery day (or date) on the calendar.

September 2019						
SUN	MON	TUE	WED	THU	FRI	SAT
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
--	--	--	--	--	--	--

### Find Out

Direct learners to **Find out** on page 284 of the Learner's Book.

Say: Look at the picture.

Ask: Can you tell when any of the activity will start and when it will end?

### Let us Learn

- Ask the whole class to stand up. Call one girl to stand in front of the class and give her a clock and a stop watch. Upon your tap, they sing the national anthem. Ask the girl to record the starting time and the time they finished singing. Ask learners to come out with how long it took them to sing the national anthem. They do this by subtracting the starting time from the finishing time. (**Collaborative learning, attention to precision, justification of ideas**)
- Put learners into groups of four. Give each group a watch and stop watch. Within their groups, they should decide simple activities, carry out the activity and record the beginning and ending times. They should then find out how long it took to do the activities.  
Each group should present their report and justify their answers. (**Collaborative learning, attention to precision, justification of ideas**)
- Direct learners to **Let us Learn: 2** on page 285 of the Learner's Book. Discuss the table on "how long" it takes to complete events with learners. Let them know that, to calculate the time an event takes, you subtract the beginning time from the ending time.
- Put learners into new groups and present each group with a task sheet. Task each group to discuss the activities/ events on the task sheet and calculate the time it takes to complete the activities. Call each group to tell the class what they agreed on. (**Collaborative Learning**)

### Review

#### Differentiated lesson

##### Low ability learners

Learners tell the time it takes to complete given activities. E.g. cooking egg, eating, writing their names.

**High ability learners**

Learners tell the estimated time it takes to complete given activities. E.g. washing their school uniform, sleeping at night, doing their homework.

**Assessment for Learning**

Refer learners to Exercise 3 and 4 on pages 287 and 288 of the Learner's Book.

**Suggested homework**

- 1) Suggest how much time it takes to complete the activity/event.

Activity/event	Estimated time
1. Eating a ball of kenkey	
2. Brushing your teeth	
3. Washing a pair of boots	
4. Walking from the classroom to the library	
5. Running around the school block once	

- 2) Write any four activities that you do at home and give the estimated time it takes to complete the activities.

Activity/event	Estimated time

- 3) Write four activities and use the criteria in the table to find out how long it takes to complete the activities

Activity	Start	finish	How long?

For additional exercises on this module, refer to pages 209 - 213 of the Workbook

## Module 8: Reading the calendar

**Content Standard**

**B3.3.3.3:** Demonstrate an understanding of time taken by events in days, weeks and months.

**Indicator**

**B3.3.3.3.2:** Read dates on the calendar, order dates of events and count days, weeks, months and years taken by given events.

**Learning Expectation**

Learners can read dates and events on the calendar.

**Essential for Learning**

Learners can talk about the time it takes to complete simple events.

**New Words**

Calendar, dates, events, days, weeks, months, years

**Resources**

Calendar

Number of Lessons **2****Lesson 1:** Reading the months in the year**Starter:**

Play: "Race to 0"

Have learners put 99 on their place value mat, using bundles of 10s and 1s.

Call out a number between 1 and 10, for example 6. Learners must remove that number of straws in their place value mat.

Call out another number between 1 and 10. Learners must again remove that number of straws or sticks from the straws on their place value mat. If they do not have enough ones in the ones' places to subtract, they must trade a bundle of 10 for 10 ones, place them in the one's column and then subtract.

Continue calling out numbers for learners to subtract until they end up with 0 on their mat.

Or let learners to say the rhyme "Thirty-days has September".

30 days has September, April, June, and November. All the rest have 31, Except for February alone, which has 28 days clear, and 29 in each leap year.

**Find Out**

Direct learners to **Find out** on page 289 of the Learner's Book.

Say: Look at the calendar.

Ask: Have you read one before? What did you use it for? Explain that the calendar shows all the days in the month of March 2019. How many days are there in March?

**Let us Learn**

- Display a calendar showing a year on the board. Let learners know that the yearly calendar is divided into 12 months: January, February, March, April, May, June, July, August, September, October, November, December.  
Each month has a number of days.  
Ask learners at random to mention the month on which they were born.
- Put learners into convenient groups. Provide them with the list of the months in the year. Read the list in order with learners. Ask them some questions like:
  - What is the 2nd month of the year? Counting down the list, we see that February is the 2nd month.
  - What is the tenth month of the year? Counting down the list, we see that October is the 10th month.
  - Which month comes before June?
  - Which months are between June and December? etc.
  - Kaki's birthday is in March. Amidu's birthday is 2 months later. In which month does Amidu's birthday fall?

Learners go through the list in order to answer these questions.

Call each group to present their answers.

**(Collaborative learning, attention to precision, justification of ideas, critical thinking)**

- Direct learners to **Let us Learn** on pages 289 and 290 of the Learner's Book. Go through the notes and calendar with learners.
- In their groups, lead learners to identify months on which special occasions like, easter, homowo, eid-al-fitr and christmas occur.

### Review

- Let Learners in groups answer these questions:
  1. How many months are in a year?
  2. Which month was your best friend born?
  3. Mention one special celebration and the month it is celebrated.

### Assessment for Learning

Refer learners to Exercise 1 on page 290 and 291 of the Learner's Book.

## Lesson 2: Reading the days and weeks in a month

### Starter:

Learners to say the rhyme "Thirty-days has September".

30 days has September, April, June, and November. All the rest have 31, Except for February alone, which has 28 days clear, and 29 in each leap year.

### Let us Learn

- Display a calendar showing a month on the board. Lead learners through these facts/activities using the calendar.
  - \* Show where the names of the days of the week are shown on a calendar. Let them know that it is represented with letters.
  - \* The last number on a calendar shows the number of days in that month.
  - \* Each square represents one day
  - \* a group of 7 days in a row is called a week.
  - \* One week is equal to 7 days
  - \* Each day of the week has a name
  - \* Each square in a column under the name of a day of the week represents 1 day with that name. i.e. all squares

under Wednesday represent 1 Wednesday

- \* "If we are this day" (point to a square), "1 week later would be" (point to square underneath)
- \* Ask them which square would be 2 weeks later, or 3 weeks later
- \* Explain that a square above shows 1 week ago (in the past)
- \* Ask them which square would be 2 weeks ago or another number of weeks ago.
- Let learners know that:
  - \* Each month in the calendar is divided into weeks and the weeks are divided into 7 days each: Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday.
  - \* Each day in a month is assigned a specific number.
- Direct learners to the calendar on page 290 of the Learner's Book. Go over the names of the months with the class again.
- Put learners into groups and present each group with a calendar.
- Task learners to read the date from the calendar by circling the day in the right month.
- Lead class to identify the dates for some of the yearly occasions like Christmas, Easter, Ramadan, etc. (**Collaborative learning, attention to precision, justification of ideas, critical thinking**)

### Review

- Learners mention the days of the week.
- Learners tell you how many days make a year.
- Learners identify dates on a calendar.

### Assessment for Learning

Refer learners to Exercise 2 on page 291 of the Learner's Book.

### Suggested home works

1. Write the number of days in each of the month.
2. Write the date of your mother and father's/ guardian's birthday.
3. Write the names of the months of the year.

For additional exercises on this module, refer to pages 214 - 217 of the Workbook.



## Module 9: Relationship between times

**Content Standard**

**B3.3.3.3:** Demonstrate an understanding of time taken by events in days, weeks and months.

**Indicator**

**B3.3.3.3.3:** Relate the number of seconds to a minute, minutes to an hour and days to a month in a problem-solving context.

**Learning Expectation**

Learners will be able to understand the relationship between seconds, minutes, hours, days and months.

**Essential for Learning**

Learners can tell the time it takes to complete simple events.

**New Words**

Seconds, minutes, hours, day, weeks, months, years

**Resources**

Calendar, wall clock, stop watch.

Number of Lessons 3

**Lesson 1:** Relationship between seconds and minutes**Starter**

Play: "Race to 0"

Have learners put 99 on their place value mat, using bundles of 10s and 1s.

Call out a number between 1 and 10, for example 6. Learners must remove that number of straws in their place value mat.

Call out another number between 1 and 10. Learners must again remove that number of straws or sticks from the straws on their place value mat. If they do not have enough ones in the ones' places to subtract, they must trade a bundle of 10 for 10 ones, place them in the one's column and then subtract.

Continue calling out numbers for learners to subtract until they end up with 0 on their mat.

**Find Out**

Direct learners to **Find out** on page 293 of the Learner's Book.

Say: Look at the picture. It takes Kweku 90 minutes to jog from his house to the beach every Saturday morning. Can we say the 90 minutes in hours? How many hours can we find in 90 minutes?

**Let us Learn**

- Review lesson on features of the clock with learners.
- Direct learners to **Let us Learn** on pages 293 and 294 of the Learner's Book. Explain that we can use analogue or digital clocks and watches to tell the time. Time starts with seconds. As the seconds move, we get minutes, then hours, then days, and so on. There are 60 seconds in a minute.

60 seconds make one minute.

- Put learners into groups and present each group with a task sheet.
- Task them to complete the tasks. E.g.  
4 minutes = .....seconds  
1 minute = .....seconds  
.....minutes = 360seconds
- Allow learners time to make presentation to class. (**Collaborative learning, attention to precision, justification of ideas, critical thinking**)

**Review****Differentiated lesson****Low ability learners**

- Learners convert seconds into minutes.  
1) 120 seconds    2) 180 seconds.



**High ability learners**

- Learners convert seconds into minutes and vice versa.

- 1) 360 seconds      2) 240 seconds.
- 3) 4 minutes        4) 110 minutes.

**Assessment for Learning**

Refer learners to Exercise 1, question a: 1 - 4 on page 294 of the Learner's Book.

## Lesson 2: Relationship between minutes and hours; hours and days

**Starter**

Play: "Race to 0"

Have learners put 99 on their place value mat, using bundles of 10s and 1s.

Call out a number between 1 and 10, for example 6. Learners must remove that number of straws in their place value mat.

Call out another number between 1 and 10. Learners must again remove that number of straws or sticks from the straws on their place value mat. If they do not have enough ones in the ones' places to subtract, they must trade a bundle of 10 for 10 ones, place them in the one's column and then subtract.

Continue calling out numbers for learners to subtract until they end up with 0 on their mat.

**Let us Learn**

- Review lesson on relationship between seconds and minutes with learners.
- Direct learners to **Let us Learn** on page 294 of the Learner's Book.  
Take them through **Read this**. 60 minutes is equivalent to 1 hour and 24 hours is equivalent to 1 day.  
We can work out other equivalences using mental calculation strategies. For example:

60 seconds make one minute.

60 minutes make one hour.

24 hours make one day.

- Put learners into groups and present each group with a task sheet.
- Task them to complete the tasks. E.g.  
120 minutes = ..... hours  
240 minutes = ..... hours  
..... minutes = 3 hours  
1 day = ..... hours  
48 hours = ..... days.
- Allow learners time to make presentation to class. (*Collaborative learning, attention to precision, justification of ideas, critical thinking*)

**Review****Differentiated lesson****Low ability learners**

- Learners work in pairs to:
  - Change 2 hours into minutes
  - Change 180 minutes into hours.

**High ability learners**

- Learners work in groups to find:
  - Number of minutes in 1 week.
  - Number of hours in 1 week.

**Assessment for Learning**

Refer learners to Exercise 1, question b: 5 -10 on pages 294 and 295 of the Learner's Book.

## Lesson 3: Relationship between days and weeks; months and year

**Starter**

Play: "Race to 0"

Have learners put 99 on their place value mat, using bundles of 10s and 1s.

Call out a number between 1 and 10, for example 6. Learners must remove that number of straws in their place value mat.

Call out another number between 1 and 10. Learners must again remove that number of straws or sticks from the straws on their place value mat. If they do not have enough ones in the ones' places to subtract, they must trade a bundle of 10 for 10 ones, place them in the one's column and then subtract.

Continue calling out numbers for learners to subtract until they end up with 0 on their mat.

### Let Us Learn

- Direct learners to **Let us Learn** on pages 293 and 294 of the Learner's Book.  
24 hours are equivalent to 1 day. 7 days make 1 week, etc.

60 seconds one minute;

60 minutes one hour;

24 hours one day;

7 days one week

52 weeks one year;

12 months one year

- Put learners into groups and present each group with a task sheet.  
Task them to complete the tasks. E.g.  
..... days = ..... week  
2 weeks = ..... days  
1 week = ..... hours
- Allow learners time to make presentation to class. (**Collaborative learning, attention to precision, justification of ideas, critical thinking**)

### Review

#### Differentiated lesson

##### Low ability learners

- Learners convert hours into days; days into weeks, etc. and vice versa.  
1) How many hours are in 2 days.  
2) How many weeks are in 1 year.

##### High ability learners

- Learners convert hours into days; days into weeks, etc. and vice versa.  
1) Change 156 weeks to years.  
2) Change 5 years into months.

**Assessment:** Refer learners to Exercise 2 on page 295 of the Learner's Book.

### Suggested homework

Complete the tables

a)

seconds	minutes
360	.....
120	.....
.....	10

b)

hours	minutes
2	.....
.....	120
.....	480

c)

hours	days
24	.....
.....	2
.....	4

For additional exercises on this module, refer to pages 218 - 219 of the Workbook

Encourage learners to do the reflection exercises on page 296 after this sub-strand.

Learners complete the self-assessment table on page 297. This will help you know each learner's strength and weaknesses.

**4**

**Strand:**

**Data**

**Module 1:** Gathering and organizing data**Content Standard**

**B3.4.1.1:** Collect first –hand data and organize it using talks, checkmarks etc.

**Indicator**

**B3.4.1.1.1:** Gather and record Data.

**Learning Expectation**

Learners will be able to: Gather and record data to answer questions

**Essentials for Learning**

Learners can group objects and count to find how many.

**New words**

tally, labels, data, information, chart, record.

**Resources**

different mineral bottle caps, pictures of fruits, pebbles (stones)

Number of Lessons **2**

**Lesson 1:** Collecting and organizing data (1)**Starter**

How many make 10?. Show a number of fingers and learners call out a number which when added to the number makes ten.

**Find out**

Refer learners to page 300 of the Learner's Book, learners identify and count the number of vegetables and record it.

Garden eggs    —  15  
Tomatoes       —  18  
Onions           —  9

**Let Us Learn**

- Have learners pick different types of items outside the classroom. Group them according to the items picked. Learners count and record the number of items picked. leaves, stones, flowers
- Have learners tally the number of items collected. Example:

Item	Tally	Number
Leaves		24
Stones		15
Flowers		27

*(critical thinking, collaborative learning)*

- Display objects (bottle caps) on a table. Have learners in their groups sort them according to their brand and record their findings in a tally chart. Learners go round and compare their findings. Learners select a leader to record their findings on the board.

Drinks	Tally	Number
Fanta		29
Coke		16
Sprite		22

*(critical thinking, collaboration learning, leadership attention)*

- Refer learners to **Let us learn: 1** on page 300 of the Learner's Book. Go through the exercise with them.
- Learners use the data to draw a Tally chart.

**Review Exercise**

Learners count and draw a tally table for the following items;  
Coloured bottle caps - (8 blue, 10 red, and 5 white)

**Assessment for learning**

Refer learners to Exercises 1 on page 302 of the Learner's Book.

**Suggested Home Work**

Count and tally the number of spoons, cups and plates in your house.

## Lesson 2: Collecting and organizing data (2)

### Starter

Play multiple of numbers, if you say 1 you are out, if you say 2, you are in; so multiples of 2 are: 2, 4, 6, 8, 10, 12 .....

### Let us Learn

- Call out learners to mention their favourite colours. Learners draw tally chart for the colours mentioned. Learners work in groups of five. Learners ask questions base on the tally chart.

Colours	Tally	Number
Green		20
White		15
Yellow		24

- How many learners mentioned Green?
- How many more learners mentioned yellow than white?
- Which colour is liked most?

- Display the tally chart, have learners ask questions base on the chart by themselves. Let learners answer the questions among themselves.

Learners favourite food.

Food	Tally	Number
Ampesie		8
Banku		13
Waakye		32

- What is the difference between learners who like waakye and banku?
- How many learners like waakye?
- How many did not like banku?

**(critical thinking, collaborative learning, problem solving skill)**

Refer learners to **Let us learn: 2** on page 301 of the Learner's Book to answer the questions there.

### Review Exercise

Draw a tally table on the board. Learners work in pairs and answer questions based on the table.

Subject	Tally	Number
Mathematics		14
English		18
Science		12

- How many learners like mathematics and science?
- How many less learners like science than English?
- What is the learners' favourite subject?

### Assessment for learning

Refer learners to page 303 of the Learner's Book for exercise.

### Suggested Home Work

Draw a tally chart for the favourite colour of your family members.

For additional exercises on this module, refer to pages 222 - 224 of the Workbook

**Module 2:** Drawing and interpreting graphs**Content standard**

**B3.4.1.2:** Construct and interpret concrete graphs and pictographs to solve problems

**Indicator**

**B3.4.1.2.1:** Draw and interpret Concrete graph and pictographs to solve problems

**Learning Expectation**

Learners need to be able: to draw and interpret graphs.

**Essentials for Learning**

Learners can organize and draw tally table for a given data.

**New Words**

Interpret, concrete, graph, pictograph.

**Resources**

bottle caps, pictures of fruit, animals, balls, sheets of paper, cut out shapes of animals, fruits.

Number of Lessons **3**

**Lesson 1:** Drawing concrete graph and pictograph**Starter**

Play: Multiples of five; if you say any number which is not a multiple of 5 you are out.  
Multiple of 5: 5, 10, 15 .... you are in; so 5, 10, 15 19 .... you are out.




**Find out**

Refer learners to page 304 of the Learner's Book.

Learners discuss the activities there and state the sports they like best.

**Let us learn**

- Give learners cut out shapes. Learners work in groups of five. Learners arrange the shapes in line (vertical/horizontal) forming concrete graph.
- Display cut out cards of fruits on a table. Learners in their groups write the fruit they like best on a sheet of paper. Learners pick the fruit and paste it against the one they like best.

Fruit	Number of fruit
Pear	
Mango	
Pineapple	

- Refer learners to pages 304 and 305 of the Learner's Book. Go through the **Let us Learn: 1** with them. Learners identify

the number of mangoes picked for the 3 days. They also go through the remaining exercise.

**Review Exercise****Low Ability Learners**

- Give different bottle caps to learners. Let learners arrange them in line both vertical and horizontal.  
fanta → 8, coke → 5, sprite – 11

**High Ability learners**

- In groups of five, learners mention the fruits they like best. Use cut-out shapes of fruits to form a picture graph.

**Assessment for learning**

Refer learners to Exercise 1 on page 309 of the Learner's Book.

**Suggested Home Work**

- Draw a concrete graph for the table below.  

onions	12
pepper	15
tomato	8
- In your house, count the number of bowls, cups and spoons and draw a picture graph for it.



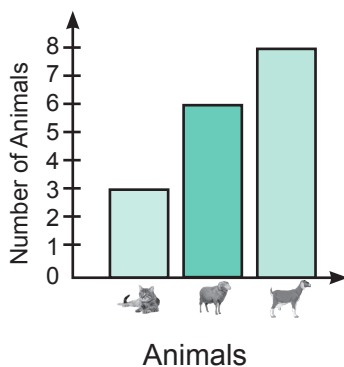
## Lesson 2: Drawing bar graphs

### Starter

Learners sing a song "I'm counting one"

### Let us Learn

- Display a chart with different kinds of animals on the board.
- Have learners count each type of animal and record it. Example: cat - 3, sheep - 6 and goat - 8.
- Demonstrate how to draw a bar graph on the board for learners.



- Task them to use the details they recorded to draw a bar graph in their groups to show the number of animals selected.
- Draw a table showing learners favourite drinks. Have learners in group of five represent their favourite drinks in a bar graph. Learners compare their graphs with other group members.

Drinks	Number
Fanta	10
Sprite	8
Coke	5

- Refer learners to **Let us learn: 2** on pages 306 and 307 of the Learner's Book. Go through the activities with them.

### Review Exercise

- Draw a bar graph for the table below.

#### Favourite Food of Primary 3 learners.

Food	Number
Rice	7
Fufu	5
Gari and beans	3

### Assessment for Learning

Refer learners to Exercise 2 on page 309 of the Learner's Book.

### Suggested Home Work

Draw a bar graph for this data (my favorite pet)

Pet	No of Learners
cat	4
dog	5
sheep	6

## Lesson 3: Interpretation of graphs

### Starter

Play counting by 4s up to 40.

If you say 3 you are out, if you say 4 you are in so 4, 8, 12, 16 \_ \_ \_

### Let us Learn

- Put learners into groups of five. Learners mention their favourite numbers and one records on a sheet of paper. Learners ask questions among themselves.

#### Favourite numbers

Number	Number of learners
Two	18
Five	15
Ten	28

- How many learners like five?
  - How many more learners like Ten than Two?
  - Which number is liked the most?
- Display a chart showing a bar graph to learners in their groups. Have learners ask questions based on the graph. Let learners answer the questions among themselves.
  - Refer learners to **Let us learn: 3** on pages 307 to 308 of the Learner's Book. Go through the activities with them.

### Review Exercise

- Learners work in pairs and answer these questions.
  - How many learners come to school by foot?
  - How many more learners come to school by foot than by bicycle?
  - How many learners come to school by cars?
  - Which one is the most popular means of transport?

**Assessment for Learning**

Refer learners to page 310 of the Learner's Book for exercise.

**Suggested Home work**

- 1) How many more plates than spoons do you have in your house?
- 2) How many less girls than boys are in your family?

For additional exercises on this module, refer to pages 225 - 227 of the Workbook

Encourage learners to do the reflection exercises on pages 311 after this sub-strand.

Learners complete the self-assessment table on page 312. This will help you know each learner's strength and weaknesses.

**Strand 1**

**Sub-Strand 1:** Number: Counting, Representation, Cardinality & Ordinality

**Module 1:** Number names**Exercise 1** Page 9

- 1 b    2 a    3 c    4 b    5 a

**Exercise 2** Page 10

- 1 → d    2 → e    3 → a    4 → b    5 → c

**Module 2:** Counting Sequence (1)**Exercise 1** Page 14

- 1 36, 38, 39 and 41  
 2 98, 97, 95 and 93  
 3 88, 91, 92 and 94  
 4 46, 49, 50 and 53  
 5 102, 101, 98 and 96

**Exercise 2** Page 15

- 1 235, 255, 265 and 285  
 2 733, 713, 703 and 683  
 3 556, 526, 496 and 486  
 4 989, 979, 959 and 949  
 5 750

**Exercise 3** Page 16

- 1 856, 806, 706 and 656  
 2 351, 401, 551 and 601  
 3 354 and 555  
 4 8 numbers  
 5 968, 918, 868, 818, 768 and 718

**Module 3:** Counting Sequences (2)**Exercise 1** Page 19

- 1 850  
 2 745  
 3 462, 562, 662, 762, 862, 962  
 4 3324, 3224, 3124, 3024, 2924, 2824  
 5 7845, 7945, 8045

**Exercise 2** Page 20

- 1 475, 975, 1475, 1975, 2475, 2975  
 2 1313, 2813, 3313, 4313  
 3 8639, 8139, 6639, 5639  
 4 623, 1623, 2623, 3123,  
 5 7942, 7442, 6442  
 6 9000, 8500, 8000

**Exercise 3** Page 21

- 1 1129, 2129, 3129, 4129, 5129, 6129  
 2 712, 1712, 2712, 3712, 4712, 5712, 6712  
 3 456, 1456, 2456, 3456, 4456, 5456, 6456  
 4 3140, 4140, 5140, 6140, 7140, 8140, 9140  
 5 200, 1200, 2200, 3200, 4200, 5200, 6200

**Module 4:** Estimation quantities**Exercise 1** Page 23

- 1 Estimate – Learner's answer Actual count – 38  
 2 Estimate – Learner's answer Actual count – 99  
 3 Estimate – Learner's answer Actual count – 54  
 4 Estimate – Learner's answer Actual count – 44  
 5 Estimate – Learner's answer Actual count – 64  
 6 Estimate – Learner's answer Actual count – 48

**Module 5:** Representing numbers or quantities with numerals**Exercise 1** Page 24

- 1 683  
 2 852  
 3 455  
 4 974  
 5 1000

**Exercise 2** Page 28

- 1 623  
 2 841  
 3 362  
 4 903  
 5 1000

**Module 6:** Writing number names**Exercise 1** Page 33

Coloured numbers: 30, 40, 50, 70  
 30 – Thirty; 40 – Forty; 50 – Fifty;  
 70 – Seventy

**Exercise 2** Page 34

- 1 → b    2 → d    3 → f    4 → a    5 → g  
 6 → e    7 → c

**Module 7:** Describing the position of numbers**Exercise 1** Page 37

- 1 check on learners answers.  
 2 3,812, 9185, 1613  
 3 2,547, 4,671  
 4 8,428  
 5 990






## ANSWERS

### Module 8: Relationship between Numbers

#### Exercise 1 Page 42

- 1 2,412 and 2,402 Not the same. Reason – learners reason
- 2 4,314 and 3,424 not the same  
Reason – learners reason
- 3 2,410 and 2,310 Not the same – learners reason

#### Exercise 2 Page 44

- 1 431 
- 2 2421 
- 3 2545 
- 4 3101 
- 5 6214 

### Module 9: Describing the relationship between numbers up to 10,000

#### Exercise 1 48

- 1 → C    2 → e    3 → a    4 → b    5 → d

#### Exercise 2 Page 49

- 1 5,332
- 2 6,306
- 3 8,103
- 4 9,210
- 5 10,000

### Module 10: Relationship between numbers

#### Exercise 1 Page 53

- 1 764
- 2 Any one of these: 174, 176, 471, 476, 671, 674.
- 3 146
- 4 Any one of these: 614, 617, 641, 647, 671, 674.
- 5 Any one of these: 164, 174, 614, 674, 714, 764.

#### Exercise 2 Page 54

Question 1 to 4 check on Learner's answers.

Question 5 to 7: Any three of these numbers.

- 368: Three hundred and sixty eight  
 386: Three hundred and eighty six  
 638: Six hundred and thirty eight  
 683: Six hundred and eighty three  
 836: Eight hundred and thirty six  
 863: Eight hundred and sixty three

### Module 11: Decomposing numbers

#### Exercise 1 Page 56

- 1 625 - 600 - 20 - 5
- 2 864 - 800 - 60 - 4

$$3 \quad 2,458 - 2,000 - 400 - 50 - 8$$

$$4 \quad 4,507 - 4,000 - 500 - 0 - 7$$

$$5 \quad 5,000 - 5,000 - 0 - 0 - 0$$

#### Exercise 2 Page 57

$$1 \quad 5,455 - 5,000 - 400 - 50 - 5$$

$$2 \quad 8,070 - 8,000 - 0 - 70 - 0$$

$$3 \quad 7,264 - 7,000 - 200 - 60 - 4$$

$$4 \quad 9,663 - 9,000 - 600 - 60 - 3$$

$$5 \quad 6,307 - 6,000 - 300 - 0 - 7$$

### Module 12: Comparing and ordering whole numbers (1)

#### Exercise 1 Page 60

- 1 120 is a little smaller than 128  
128 is a little larger than 120
- 2 932 is a lot larger than 549  
549 is a lot smaller than 932
- 3 10,000 is a lot larger than 4351  
4351 is a lot smaller than 10,000
- 4 258 is a lot smaller than 8258  
8258 is a lot larger than 258
- 5 672 is a little smaller than 675  
675 is a little larger than 672
- 6 720 is a lot smaller than 800  
800 is a lot larger than 720

#### Exercise 2 Page 61

- 1 >    2 <    3 =    4 <    5 >

### Module 13: Comparing and ordering whole numbers (2)

#### Exercise 1 Page 66

- 1 145, 240, 296, 363, 581
- 2 898, 995, 3571, 4305, 5002
- 3 597, 672, 795, 823, 832
- 4 984, 948, 894, 849, 498
- 5 632, 623, 362, 326, 236

#### Exercise 2 Page 67

- 1 167, 173, 177, 183, 185, 187
- 2 465, 475, 485, 490, 510, 520
- 3 983, 953, 933, 923, 893, 883
- 4 4845, 5045, 5245, 5345, 5645, 5845
- 5 10000, 9950, 9800, 9750, 9650, 9550

#### Exercise 3 Page 68

- 1 795, 764, 753, 746, 735
- 2 586, 580, 568, 558, 508
- 3 9170, 9107, 7910, 1970, 1709
- 4 375, 537, 573, 735, 753
- 5 689, 999, 1502, 2154, 5210

**Module 14:** Comparing and ordering whole numbers (3)

**Exercise 1** Page 71

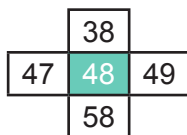
- 1 2590, 2740, 2840, 2990, 3040
- 2 6900, 7200, 7600, 7700, 8000
- 3 8851, 8901, 9101, 9251, 9301
- 4 9000, 9300, 9600, 9800, 10000
- 5 100, 300, 500, 600, 700, 900
- 6

**Exercise 2** Page 72

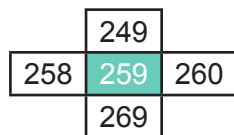
- 1 102, 103, 104, 105, 106, 107, 108, 109
- 2 360, 370, 380, 390, 400, 410, 420, 430
- 3 517, 519, 523, 525, 527, 529, 531
- 4 813, 818, 823, 828, 833, 838, 843
- 5 147, 157, 167, 177, 187, 197, 207, 227,

**Exercise 3** Page 72

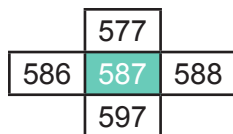
Eg



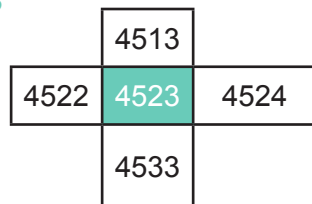
1



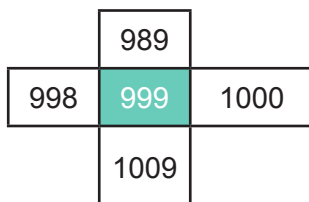
2



3



4



**Module 15:** Comparing and ordering whole numbers (4)

**Exercise 1** Page 74

- 1 Fatima sold 110 loaves more than Araba or Araba sold 110 loaves less than Fatima.
- 2 Maame Mansah has 425 cartons less than Papa Dela or Papa Dela has 425 cartons more cartons than maame Mansah.
- 3 Mr. Kotey has GH¢550 more than Madam Korkor or Madam Korkor has Gh¢550 less than Mr. Kotey.
- 4 Mr Allotey has 300 seedlings more than Mr. Boadi or Mr. Boadi has 300 seedlings less than Mr. Allotey.

**Module 16:** Positive and negative number representation

**Exercise 1** Page 77

- 1 Negative
- 2 Positive
- 3 Positive
- 4 Positive
- 5 negative

**Module 17:** Describing situations using positive and negative values

**Exercise 1** Page 80

- 1 

			-5	-4			-2		0			3	4		6
--	--	--	----	----	--	--	----	--	---	--	--	---	---	--	---
- 2 

	-9	-8							0			3	5		8
--	----	----	--	--	--	--	--	--	---	--	--	---	---	--	---
- 3 

	-7		-5	-4				0				4	5		7
--	----	--	----	----	--	--	--	---	--	--	--	---	---	--	---
- 4 

		-8			-5	-3			0			3		6	
--	--	----	--	--	----	----	--	--	---	--	--	---	--	---	--
- 5 

			-6		-4		-2		0			4			9
--	--	--	----	--	----	--	----	--	---	--	--	---	--	--	---

**Module 18:** Counting forwards and backwards

**Exercise 1** Page 83

- |     |      |     |
|-----|------|-----|
| 1 4 | 2 2  | 3 1 |
| 4 5 | 5 -2 |     |

**Exercise 2** Page 84

- |        |        |         |
|--------|--------|---------|
| 1 24°C | 2 -8°C | 3 -10°C |
| 4 -2   | 5 -5   | 6 -6    |

**Reflection Exercise 1** Page 85

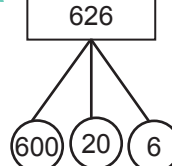
- 1 a 5,015 b 9,807
- 2 a Three thousand nine hundred and thirty six.  
b Eight thousand and seventy five.
- 3 a 454; 504; 554.  
b 5,150; 4,850; 4,750.  
c 4,506, 5006, 6006.
- 4 2,220

**Reflection Exercise 2** Page 86

- 1 a 

626
-----

 b  $2,345 = 2,000 + 300 + 40 + 5$



- 2 Check on learners answers - Any 3-digit number with 4 in the middle.
- 3 a > b > c = d <
- 4 137, 319, 379, 739, 897.
- 5 8,900; 9,200; 9,500; 9,800; 9,900

## ANSWERS

6 a Gh¢4.00 b Gh¢1.00

**Strand 1: Number**

**Sub-Strand 2: Number Operations (Addition, Subtraction, Multiplication and Division)**

**Module 1: Addition and subtraction facts (fluency1)**

**Exercise 1**

Page 91

1 122 2 74 3 359  
4 84 5 223

**Exercise 2**

1 48 2 52 3 66  
4 234 5 386

**Module 2: Addition And Subtraction facts (2)**

**Exercise 1**

Pages 94 and 95

1 82 2 96 3 64  
4 941 5 981

**Exercise 2**

1 43 2 41 3 683  
4 777 5 503

**Module 3: Addition and subtraction**

**Exercise 1**

Page 100

1  $\neq$  2  $=$  3  $\neq$  4  $\neq$

**Exercise 2**

Page 101

1 a  $\neq$  b  $=$  c  $\neq$  d  $=$  e  $=$   
2 a 106 b  $< 79$  or  $> 79$   
c  $< 221$  or  $> 221$  d 776

**Module 4: Relationship between addition and subtraction**

**Exercise 1**

Page 105

1 156 / 243 2 538 / 538  
3 212 / 212 4 725 / 206  
5 295 / 295

**Exercise 2**

1 32 2 48 3 29  
4 84

**Module 5: Addition strategies (1)**

**Exercise 1**

Page 107

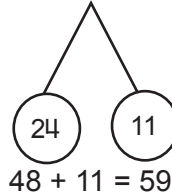
1 a 13 b 13 c 10 d 3  
2 a 6 b  $6+7=13$  c 6 d  $13-7=6$   
3 a 8 b 9 c  $17-9=8$  d 8  
4 a 5 b  $5+8=13$  c  $13-8=5$  d  $13-5=8$   
5 a 9 b  $9+6=15$  c  $15-9=6$  d  $15-6=9$

**Module 6: Addition strategies (2)**

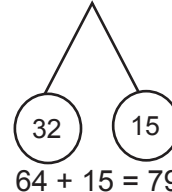
**Exercise 1**

Page 110

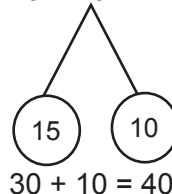
1  $24 + 35$



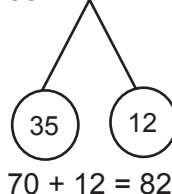
2  $32 + 47$



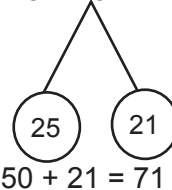
3  $15 + 25$



4  $35 + 47$



5  $25 + 46$



**Exercise 2**

Page 110

1 43 2 91 3 38  
4 53 5 92

**Module 7: Addition strategies (3)**

**Exercise 1**

Page 113

1 87 2 74 3 64  
4 72 5 100

**Exercise 2**

Page 114

1 83 2 90 3 95  
4 100

**Exercise 3**

1 91 2 82 3 85  
4 87



**Module 8: Subtraction strategies (1)**
**Exercise 1** Page 117

1 11 2 22 3 25  
4 44 5 28

**Exercise 2**

1 13 2 31 3 32  
4 23 5 15  
6 46

**Exercise 3** Page 118

1 21 2 26 3 34  
4 36 5 40 6 47

**Module 9: Subtraction strategies (2)**
**Exercise 1** Page 123

1 34 2 27 3 14  
4 27 5 26

**Exercise 2**

1 21 2 29 3 37  
4 33 5 38

**Module 10: Addition of 2 and 3 digit numbers**
**Exercise 1** Page 127

1  $35 + 23 = 58$  2  $56 + 23 = 79$   
3  $54 + 23 = 77$  4  $425 + 66 = 491$

**Exercise 2** Page 128

1  $125 + 143 = 268$  2  $425 + 306 = 731$   
3  $416 + 105 = 521$  4  $376 + 447 = 823$   
5  $346 + 253 = 599$

**Module 11: Subtraction of 2-and 3-digit numbers**
**Exercise 1** Page 134

1 21 2 34 3 34  
4 319 5 367

**Exercise 2**

1 274 2 126 3 166  
4 319 5 267

**Module 12: Addition of whole numbers (1)**
**Exercise 1** Page 138

1 377 2 667 3 479  
4 615 5 799

**Exercise 2**

1 628 2 767 3 604  
4 919 5 790 6 300

**Exercise 3**

1 399 2 513 3 881  
4 629 5 530

**Module 13: Addition of whole numbers (2)**
**Exercise 1** Page 142

1 674 2 850 3 694  
4 820 5 954

**Exercise 2**

1 784 2 879 3 448  
4 906 5 866

**Module 14: Subtraction of whole numbers (1)**
**Exercise 1** Page 147

1 164 2 252 3 411  
4 322 5 328 6 390

**Exercise 2**

Page 148  
check learners answers.

**Module 15: Subtraction of whole numbers (2)**
**Exercise 1** Page 152

1  $264 - 38 = 264 - 40 + 2 = 226$   
2  $443 - 27 = 443 - 30 + 3 = 416$   
3  $562 - 149 = 562 - 150 + 1 = 413$   
4  $856 - 328 = 856 - 330 + 2 = 528$   
5  $373 - 55 = 373 - 60 + 5 = 318$

**Exercise**

Page 153  
**Example** 110 1 327 2 216  
3 418 4 362 5 523

**Module 16: Word problems addition and subtraction**
**Exercise 1** Page 160

1  $452 \rightarrow 500$  2  $252 \rightarrow 300$   
 $+ 324 \rightarrow \underline{300}$   $+ 368 \rightarrow \underline{400}$   
 $\underline{800}$   $\underline{700}$   
3  $363 \rightarrow 400$  4  $598 \rightarrow 600$   
 $+ 429 \rightarrow \underline{400}$   $+ 176 \rightarrow \underline{200}$   
 $\underline{800}$   $\underline{800}$   
5  $463 \rightarrow 500$  6  $846 \rightarrow 800$   
 $+ 99 \rightarrow \underline{100}$   $+ 136 \rightarrow \underline{100}$   
 $\underline{600}$   $\underline{900}$

## Exercise 2

Page 161

1  $572 - 235 = ?$

$600 - 200 = 400$

2  $682 - 457 = ?$

$700 - 500 = 200$

3  $672 - 252 = ?$

$700 - 300 = 400$

## Module 17: Commutative property of addition

### Exercise 1

Page 164

1 a  $45 + 32 = 77$   
b  $32 + 45 = 77$  a = b

2 a  $82 + 14 = 96$   
b  $14 + 82 = 96$  a = b

3 a  $347 + 421 = 768$   
b  $421 + 347 = 768$  a = b

4 a  $652 + 143 = 795$  5 a  $523 + 406 = 929$   
b  $143 + 652 = 795$  b  $406 + 523 = 929$

6 a  $372 + 616 = 988$   
b  $616 + 372 = 988$  a = b

## Module 18: Multiplication (1)

### Exercise 1

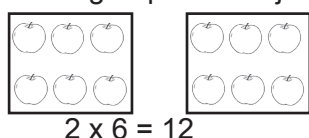
Page 167

- 1 3 groups of 6 =  $3 \times 6 = 18$  in all
- 2 2 groups of 3 =  $2 \times 3 = 6$  in all
- 3 3 groups of 4 =  $3 \times 4 = 12$  in all
- 4 4 groups of 5 =  $4 \times 5 = 20$  in all
- 5 5 groups of 2 =  $5 \times 2 = 10$  in all

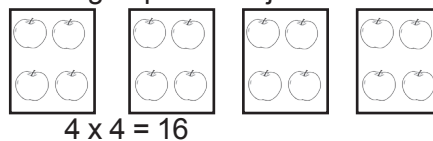
### Exercise 2

Page 169

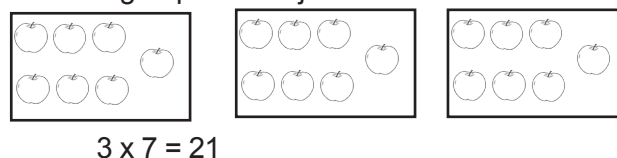
- 1 2 groups of 6 objects



- 2 4 groups of 4 objects



- 3 3 groups of 7 objects



## Module 19: Multiplication (2)

### Exercise 1

Page 173

- 1  $4 \times 6 = 24$
- 2  $3 \times 7 = 21$
- 3  $5 \times 5 = 25$
- 4  $3 \times 9 = 27$

### Exercise 2

Page 174

- 1  $5 \times 5 = 25$
- 2  $4 \times 6 = 24$
- 3  $7 \times 4 = 28$
- 4  $2 \times 9 = 18$
- 5  $5 \times 8 = 40$
- 6  $3 \times 5 = 15$

## Module 20: Multiplication (3)

### Exercise 1

Page 178

- 1a  $7 \times 2 = 14$  1b  $4 \times 4 = 16$  1c  $3 \times 5 = 15$   
2a  $7 \times 2 = 14$  2b  $8 \times 3 = 24$

### Exercise 2

Page 179

0	5	10	15	20	25	30	35	40	45
---	---	----	----	----	----	----	----	----	----

- 1 0 5 10 15 20 25 30 35 40 45
- 2 a  $4 \times 5 = 20$
- b  $5 \times 2 = 10$
- c  $8 \times 5 = 40$
- d  $5 \times 3 = 15$
- e  $9 \times 5 = 45$
- f  $5 \times 1 = 5$
- g  $0 \times 5 = 0$
- h  $5 \times 7 = 35$
- i  $6 \times 5 = 30$

## Module 21: Multiplication (4)

### Exercise 1

Page 183

- 1 12 2 30 3 20 4 21

**Module 22: Division (1)**

**Exercise 1** Page 186

1  $15 \div 5 = 3$  2  $20 \div 5 = 4$   
5 groups of 3 5 groups of 4

3  $18 \div 3 = 6$  4  $8 \div 2 = 4$   
3 groups of 6 2 groups of 4

**Exercise 2** Page 188

**Example:**  $30 \div 5 = 6$  1  $21 \div 3 = 7$

2  $12 \div 4 = 3$  3  $20 \div 4 = 5$

4  $21 \div 3 = 7$  5  $14 \div 7 = 2$

**Module 23: Division (2)**

**Exercise 1** Page 193

1 4 2 7 3 9

4 6 5 7

**Exercise 2** Page 194

1 5 2 2 3 4

4 4 5 6 6 9

**Module 24: Division (3)**

**Exercise 1** Page 197

1 6 2 4 3 3

4 4 5 9 6 9

**Exercise 2** Page 198

1 5 2 8 3 9

4 7 5 5 6 5

**Reflection Exercise 3** Page 199

1 a 73 b 51 2 56 3 a 93 b 738

4 25

**Reflection Exercise 4** Page 199

1 a 32 b 543 2 a 48;80 b 377;377

H	T	O
-	7 4	5 3
	3	2

	H	T	O
-	6	2 8	7 4
	5	4	3

3 1 → b 2 → d 3 → e 4 → a 5 → c

4a 8 b 7 c 9

**Strand 1: Number**

**Sub-Strand 3: Fractions**

**Module 1: Unit fractions**

**Exercise 1** Page 203

1  $\frac{1}{3}$  2  $\frac{1}{5}$  3  $\frac{1}{8}$

4  $\frac{1}{6}$  5  $\frac{1}{4}$  6  $\frac{1}{2}$

**Exercise 2** Page 204

To be done by learners in different ways.

**Module 2: Multiples of unit fractions**

**Exercise 1** Page 207

1 

1/8	2/8	3/8	4/8	5/8	6/8	7/8	8/8
-----	-----	-----	-----	-----	-----	-----	-----

2 

1/10	2/10	3/10	4/10	5/10	6/10	7/10	8/10
------	------	------	------	------	------	------	------

3 

1/6	2/6	3/6	4/6	5/6	6/6	7/6	8/6
-----	-----	-----	-----	-----	-----	-----	-----

4 

1/5	2/5	3/5	4/5	5/5	6/5	7/5	8/5
-----	-----	-----	-----	-----	-----	-----	-----

**Exercise 2** Page 208

1  $\frac{1}{6}$  2  $\frac{4}{9}$  3  $\frac{5}{8}$

4  $\frac{3}{9}$  5  $\frac{4}{6}$  6  $\frac{4}{10}$

**Module 3: Fraction of a group**

**Exercise 1** Page 210

1  $\frac{6}{12}$  or  $\frac{1}{2}$  2  $\frac{2}{8}$  or  $\frac{1}{4}$

3  $\frac{3}{12}$  or  $\frac{1}{4}$  4  $\frac{5}{14}$

**Exercise 2**

To be done by learners. Page 211

## ANSWERS

### Module 4: Comparing and ordering unit fractions

#### Exercise 1 Page 213

- 1  $\frac{1}{6}$   $\frac{2}{6}$   $\frac{3}{6}$   $\frac{4}{6}$   $\frac{5}{6}$
- 2  $\frac{1}{8}$   $\frac{2}{8}$   $\frac{3}{8}$   $\frac{4}{8}$   $\frac{5}{8}$   $\frac{7}{8}$
- 3  $\frac{1}{5}$   $\frac{2}{5}$   $\frac{3}{5}$   $\frac{4}{5}$   $\frac{5}{5}$
- 4  $\frac{1}{3}$   $\frac{2}{3}$   $\frac{3}{3}$   $\frac{4}{3}$   $\frac{5}{3}$   $\frac{6}{3}$   $\frac{7}{3}$

#### Exercise 2 Page 214

- 1)  $\frac{4}{7}$  is bigger than  $\frac{3}{7}$   
 2)  $\frac{5}{8}$  is bigger than  $\frac{2}{8}$   
 3)  $\frac{2}{3}$  is bigger than  $\frac{1}{3}$   
 4)  $\frac{4}{6}$  is bigger than  $\frac{2}{6}$

#### Reflection Exercise 5 Page 215

- 1  $\frac{1}{6}$       2  $\frac{1}{2}$       3  $\frac{1}{4}$       4  $\frac{1}{3}$

Question 5 to 7 check on learners answer

- 8  $\frac{3}{6}$       9  $\frac{4}{5}$

10 check learners answers

### Strand 1: Number

#### Sub-Strand 4: Money

#### Module 1: Paying the exact amount

##### Exercise 1 Page 218 and 219

- 1 - 3 To be done by learners.  
 4 GH¢18.20P      b GH¢26.00P  
 5 GH¢7.80P

##### Exercise 2 Page 220

- 1 a GH¢16  
 One GH¢10 and three GH¢2. etc.

##### Exercise 3 Page 221

- 2 GH¢5.50 or GH¢5 50p  
 3 GH¢19.70 or GH¢ 19 70p

### Module 2: Taking change

#### Exercise 1 Page 224

- 1 GH¢2.00 or GH¢ 2  
 2 GH¢4.50 or GH¢4 50p  
 3 GH¢11.80 or GH¢11 80p  
 4 GH¢17.00 or GH¢17  
 5 GH¢18.50 or GH¢18 50p

#### Exercise 2 Page 225

- 1 GH¢ 0.50 or 50p      2 GH¢ 2.50 or GH¢ 2 50 p  
 3 GH¢ 15.00 or GH¢ 15  
 4 GH¢ 38.40 or GH¢ 38 40p  
 5 GH¢ 14.20 or GH¢ 14 20p

#### Reflection Exercise 6 Page 226

Question 1, 2 and 3 check learners answers

- 4 Gh¢2.00      5 False

### Strand 2: Algebra

#### Sub-Strand 1: Patterns and Relationship

#### Module 1: Increasing and decreasing patterns

##### Exercise 1 Page 230

- 1 21, 12, Rule: Subtract 9  
 2 71, 78 Rule: Add 7  
 3 87, 95 Rule: Add 8  
 4 27, 22 Rule: Subtract 5  
 5 65, 59 Rule: Subtract 6

##### Exercise 2 Page 231

- 1 66, 71, 76, 81, 86, 91  
 2 78, 73, 68, 63, 58, 53  
 3 27, 31, 35, 39, 43, 47  
 4 85, 82, 79, 76, 73, 70  
 5 94, 84, 74, 64, 54, 44

### Module 2: Errors in patterns

##### Exercise 1 Page 233

- 1 Error 32 correct number 30  
 2 Error 116 correct number 115  
 3 Error 82 correct number 83  
 4 Error 40 correct number 43  
 5 Error 101 correct number 102

##### Exercise 2

- 1 72, 87 and 117  
 2 28, 73 and 88  
 3 60, 120 and 480  
 4 4 and 25  
 5 67, 57 and 47

#### Reflection Exercise 7 Page 240

- 1 Rule 1: Add 7  
 2 85, 90, 95.  
 3 a 57, 49, 41, 33, 25, 17  
    b 38, 45, 52, 59, 66, 73  
 4 Error 81; Correct number 79

**Strand 3: Geometry and measurement**  
**Sub-Strand 1: 2D shapes and 3D objects**

**Module 1: Describing solid shapes (1)**

**Exercise 1** Page 243

Check learners answers.

**Exercise 2** Page 244

3-D objects	faces	edges	vertices
cube	6	12	8
sphere	1	0	0
cone	2	1	1
cylinder	3	2	0

**Exercise 3** Page 245

3-D objects	faces	edges	vertices
pyramid	4	6	4
rectangular prism	6	12	8
cuboid	6	12	8
triangular prism	5	9	6

**Module 2: Regular and irregular shapes**

**Exercise 1** Page 247

1	✓	2	×	3	×
4	✓	5	×	6	×

**Exercise 2** Page 248





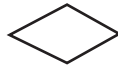
To be done by learners.

Regular shapes---- 2, 3, 6

Irregular shapes ---- 1, 4, 5, 7, 8.

**Module 3: Angles**

**Exercise 1** Page 250

shape	number of angles	equal or unequal angles
	4	equal
	3	unequal
	4	equal
	6	equal
	4	unequal

**Module 4: Angles that are right angles**

**Exercise 1** Page 253

1	✓	2	✓	3	×
4	×	5	×	6	×

**Exercise 2** Page 254

check on Learners' answers.

**Module 5: Quadrilaterals**

**Exercise 1**

To be done by learners.

**Exercise 2** Page 257

Quadrilaterals - (Blue) - 1, 2 and 5

Non-quadrilaterals (Red) - 3 and 4

**Reflection Exercise 8** Page 258

1a Rectangle b pentagon

2a and b Check on learners' answers.

3

Name	Faces	Edges	Vertices
cube	6	12	8
cone	2	1	1
triangular pyramid	4	6	4

4a and b Check on learners' answers.

## ANSWERS

### Strand 3: Geometry and measurement

#### Sub-Strand 2: Position/Transformation

##### Module 1: Positioning

##### Exercise 1 Page 261

Check on learners' answers

##### Exercise 2 Page 262

1 A 4cm B 4 cm

2 C 2.5cm D 2.2cm

3 E 3.2cm F 3.2cm

##### Reflection Exercise 9 Page 263

Check on learners' answers

### Strand 3: Geometry and measurement

#### Sub-strand 3: Measurement -Length, Mass and Capacity

##### Module 1: Measurement of length

##### Exercise 1 Page 265

1 3cm 2 2cm 3 4cm

4 5cm 5 8cm

##### Exercise 2 Page 266

Check on learners' answers

##### Module 2: Measurement of Length (relationship between cm and m)

##### Exercise 1 Page 268

1 1.5m 2 3.7m 3 2.5m

4 5m 5 4.5m 6 6m

##### Exercise 2 Page 268

1 400cm 2 350cm

3 500cm 4 300cm

5 700cm 6 280cm

##### Module 3: Measurement of length (relationship between cm and m)

##### Exercise 1 Page 270

1 - 5 Check on learners' answers

6 m 7 cm 8 cm

##### Module 4: Perimeter

##### Exercise 1 Page 272

1 20cm 2 15cm

3 24cm 4 24cm

##### Exercise 2 Page 273

1 20m 2 27cm 3 28cm

4 25m 5 19cm



**Module 5:** Measurement of mass (relationship between kilogram and gram; litres and millilitres)

**Exercise 1** Page 276

- 1 3 kg      2 5 kg  
3 7 kg      4 2 kg

**Exercise 2** Page 277

Grams	Kilograms
1000	1
3000	3
2500	2.5
3500	3.5
1500	1.5

**Exercise 3** Page 277

- 1 700ml      2 800ml  
3 300ml      4 500ml

**Exercise 4** Page 278

Litres	Millilitres
1	1000
4.5	4500
2	2000
3	3000
3.3	3300

**Module 6 and Module 7 (Exercise 1 and 2)**

Practical activities. Teachers/facilitators are to check on learners answers.

**Module 7:** Measurement of time

**Exercise 3** Page 287

- 1 1 hour 45minutes  
2 table tennis – 15 minutes  
3 netball – 1 hour 45 minutes  
4 basketball – 2 hours 50 minutes  
5 football – 1 hour 25 minutes

**Exercise 4** Page 288

- 1 7 hour 30 minutes  
2 2 hour 15 minutes  
3 50 minutes  
4 1 hour 10 minutes  
5 45 minutes

**Module 8:** Reading the calendar

**Exercise 1** Page 290

Answers depend on learners calendar year

- 1 4<sup>th</sup>, 11<sup>th</sup>, 18<sup>th</sup> and 25<sup>th</sup> April, 2019  
2 November 30  
3 October 31  
4 May 31  
5 March 31  
6 September 30  
7 February 28  
8 January 31  
9 June 30  
10 February  
11 January, March, May, July, August, October and December

**Exercise 2** Page 291

- 1a Tuesday      1b Wednesday  
1c Wednesday      1d Saturday  
2 June      3 18 days      4 14 days

**Module 9:** Solving problems with time

**Exercise 1** Pages 294 and 295

- 1 180 seconds  
2 360 seconds  
3 240 seconds  
4 900 seconds  
5 5 hours  
6 3 hours  
7 11 hours  
8 4 hours  
9 6 hours  
10 7 hours

**Exercise 2** Page 295

- 1 7 days      2 24 hours  
3 60 minutes      4 600 seconds

**Reflection Exercise 10** Page 296

- 1 a 200cm      b 150cm  
2 a 3.5m      b 4m  
3 22cm  
4 a 5l      b 4000ml  
5 25 minutes  
6 Check on learners' answers  
7 180 seconds  
8 January, March, May, July, August, October, December.

## ANSWERS

### Strand 4: Data

**Sub-Strand 1:** Data Collection, Organisation, Presentation, Interpretation and Analysis

**Module 1:** Gathering and organizing data

**Exercise 1** Page 302

**a** 25    **b** 13    **c** 7

**Exercise 2** Page 303

**1** 84 learners

**2** Pineapple

**3** Orange

**4** 50 learners

**5** 12 learners

**Module 2:** Drawing and interpreting graphs

**Exercise 1** Page 309

To be done by learners.

**Exercise 2** Page 309

To be done by learners.

**Exercise 3** Page 310




**1** 8 learners    **2** 18 learners

**3** 4 learners

**4** yellow 16 learners    **5** 46 learners

**Reflection Exercise 11** Page 311

**1a**

Shape	Tally	Number
		17
		12
		9

**b** 38

**c** 8

**d** 5

**e** 29

**Strand 1: Number**

**Sub-Strand 1: Number: Counting, Representation, Cardinality and Ordinality**

**Module 1: Number names**

**Trial 1** Page 2

- 1 1,000
- 2 1,200
- 3 4,540
- 4 2,806
- 5 3,115

**Trial 2**

- 1 One thousand four hundred and fifty six
- 2 Three thousand and seventy three
- 3 Two thousand five hundred and seven
- 4 Four thousand four hundred and forty four
- 5 Five thousand

**Trial 3** Page 3

- 1 6,075
- 2 10,000
- 3 8,541
- 4 9,266

**Trial 4**

- 1 b 8,423
- 2 a 5,912
- 3 c 7,530
- 4 c 6,016
- 5 b 9,876
- 6 a 5,906

**Module 2: Counting Sequence (1)**

**Trial 1** Page 5

- 1 17, 19, 22, 23
- 2 57, 58, 61, 62
- 3 97, 94, 93, 90
- 4 213, 212, 210, 209, 207
- 5 1,004, 1,006, 1,008, 1,009

**Trial 2**

- 1 330, 340, 370
- 2 948, 958, 988
- 3 87, 77, 27
- 4 572, 562, 532
- 5 2065, 2075, 2105

**Trial 3** Page 6

- 1a 20
- b 30, 40
- c 50 and 60
- d 70, 80

- e 90, 100
- f 110, 120
- 2 934, 944, 954, 964, 974, 984.

**Trial 4** Page 7

- 1 66, 36, 26, 16
- 2 90, 80, 60, 30
- 3 610, 600, 580, 570
- 4 1522, 1502, 1482, 1462

**Module 3: Counting Sequences (2)**

**Trial 1** Page 8

- 1 505, 705
- 2 1792, 2092
- 3 5737, 5537
- 4 679, 479
- 5 4615, 4815

**Trial 2** Page 9

- 1 750, 1250, 1750, 2250, 2750, 3250, 3750.
- 2 623, 1123, 3123.
- 3 67
- 4 5050
- 5 8500, 8000, 7500, 7000, 6500, 6000, 5500

**Trial 3** Page 10

- 1 9,600, 8,600, 7,600, 6,600, 5,600, 4,600, 3600.
- 2 642, 1,642, 2,642, 3,642, 4,642, 5,642, 6,642
- 3 590, 1,590, 4590, 5,590
- 4 8,000, 7,000, 6,000, 5000, 4000
- 5 3801, 6801, 7801, 8801, 9801

**Module 4: Estimation quantities**

**Trial 1** Page 11

- 1 Actual count 18
- 2 Actual count 16
- 3 Actual count 20

**Trial 2** Page 12

To be done by learners

- 1 Actual count 29
- 2 Actual count 38
- 3 Actual count 36
- 4 Actual count 28
- 5 Actual count 15

## ANSWERS

### Trial 3 Page 13

Estimation to be done by learners

- 1 Actual count 45
- 2 Actual count 28
- 3 Actual count 13
- 4 Actual count 30
- 5 Actual count 49

### Module 5: Representing numbers or quantities with numerals

#### Trial 1 Page 15

- 1 5, 3, 6, 536, 536
- 2 3, 5, 1, 351, 351
- 3 8, 0, 0, 800, 800
- 4 2, 6, 9, 269, 269
- 5 9, 0, 0, 900, 900

#### Trial 2 Page 17

- |   |     |   |     |
|---|-----|---|-----|
| 1 | 130 | 2 | 104 |
| 3 | 523 | 4 | 825 |
| 5 | 366 |   |     |

#### Trial 3 Page 18

- 1 Seven hundred and seventy seven 777
- 2 Four hundred and two 402
- 3 Three hundred and fifty 350
- 4 Five hundred and forty two 542

### Module 6: Writing number names

#### Trial 1 Page 19

- 1 seventy
- 2 80
- 3 fifty
- 4 ninety
- 5 30

#### Trial 2

- |   |               |   |          |
|---|---------------|---|----------|
| 1 | one hundred   | → | d (100)  |
| 2 | four hundred  | → | a (400)  |
| 3 | five hundred  | → | e (500)  |
| 4 | eight hundred | → | b (800)  |
| 5 | one thousand  | → | c (1000) |

#### Trial 3 Page 20

Multiples of 100: 400, 700, 800, 1000.  
four hundred  
seven hundred  
eight hundred  
one thousand

### Module 7: Describing the position of numbers

#### Trial 1 Page 21

- 1 To be done by learners
- 2 812; 185; 613
- 3 547; 671
- 4 428
- 5 990

#### Trial 2 Page 22

- 1 Two; 4962, 3430
- 2 10,000
- 3 3430
- 4 2405, 4832, 9939
- 5 To be done by learners

### Module 8: Relationship between numbers

#### Trial 1 Page 23

- |   |     |   |     |   |    |
|---|-----|---|-----|---|----|
| 1 | 492 | 2 | 341 | 3 | 88 |
| 4 | 222 | 5 | 111 |   |    |

#### Trial 2 Page 25

- |   |   |        |
|---|---|--------|
| 1 | → | e(404) |
| 2 | → | b(162) |
| 3 | → | d(339) |
| 4 | → | a(86)  |

#### Trial 3 Page 26

- |   |     |   |      |   |     |
|---|-----|---|------|---|-----|
| 1 | 862 | 2 | 625  | 3 | 561 |
| 4 | 309 | 5 | 2670 |   |     |

#### Trial 4 Page 27

- |   |     |   |      |   |     |
|---|-----|---|------|---|-----|
| 1 | 423 | 2 | 671  | 3 | 505 |
| 4 | 246 | 5 | 2580 |   |     |

### Module 9: Describing the relationship between numbers up to 10,000

#### Trial 1 Page 28

To be done by learners

#### Trial 2 Page 29

- 1 540
- 2 602
- 3 335
- 4 1000
- 5 3104

#### Trial 3 Page 31

To be done by learners

**Module 10: Relationship between numbers**

**Trial 1** Page 33

- 1 b 2 c 3 a  
4 c 5 a

**Trial 2** Page 33

- 1 fifty-four  
2 Two hundred and thirty six  
3 four hundred and eighty one  
4 Nine hundred and five  
5 Eight hundred and seventy

**Trial 3** Page 34

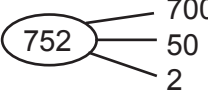

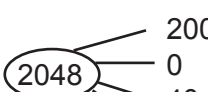


- 1 five hundred and eighty two  
2 nine hundred and eight  
3 one thousand  
4 three hundred and seventy seven  
5 eight hundred and eighty two

**Module 11: Decomposing numbers**

**Trial 1** Page 35

- 1  $700 + 80 + 5$   
2  $900 + 20 + 8$   
3  $1000 + 900 + 0 + 9$   
4  $4000 + 800 + 60 + 2$   
5  $3000 + 400 + 90 + 0$

**Trial 2** Page 36

- 1  2   
3  4   
5 

**Trial 3** Page 37

- 1  $7000 + 500 + 30 + 1$   
2  $6000 + 0 + 40 + 9$   
3  $8000 + 500 + 20 + 8$   
4  $9000 + 900 + 0 + 9$   
5  $5000 + 100 + 50 + 0$

**Module 12: Comparing and ordering whole numbers (1)**

**Trial 1** Page 38

Learners can compare in other ways

- 1 238 is a little smaller than 239  
2 8357 is a lot larger than 485  
3 1272 is a lot smaller than 9272  
4 4391 is a lot larger than 628  
5 10,000 is a little larger than 9999

**Trial 2** Page 38

- 1 < 2 >  
3 < 4 <  
5 >

**Trial 3** Page 39

- 1 >  
2 <  
3 >  
4 <  
5 >

**Module 13: Comparing and ordering whole numbers (2)**

**Trial 1** Page 40

- 1 598, 746, 807, 926, 1001  
2 6076, 7183, 7742, 8318, 9605  
3 751, 715, 571, 175, 157  
4 963, 693, 639, 396, 369  
5 876, 867, 786, 768, 687

**Trial 2** Page 41

- 1 158, 249, 375, 467, 568, 689  
2 1368, 3654, 3754, 4870, 6470, 8470  
3 498, 586, 687, 748, 768, 954  
4 10,000, 9182, 8234, 4983, 1982, 1928  
5 7563, 6753, 6653, 5836, 5763, 3657

**Trial 3** Page 42

- 1 6158, 6518, 6851, 8561, 8615  
2 5994, 9095, 9549, 9945, 10000  
3 4978, 4971, 4967, 4932, 4908, 4312  
4 7986, 7865, 7806, 7771, 7282, 7069  
5 9814, 9482, 8994, 8849, 4698, 4499

**Module 14: Comparing and ordering whole numbers (3)**

**Trial 1** Page 43

- 1 160, 165, 180, 190, 195  
2 776, 976, 1176, 1276, 1576  
3 1059, 1109, 1209, 1309, 1359  
4 386, 392, 394, 400, 408

## ANSWERS

5 633, 638, 658, 668, 683

### Trial 2 Page 44

1		113	2		46
	121	122			56
		133		66	67
	141	142			
	151	152			
	161	162			
		172			
		182			

3	4537		4539	4	197		199
	4547				207		
	4557				217		

### Trial 3 Page 45

	67	77	87	97	107	117	127	137	147
157		177	187	197		217	227	237	247
257	267	277	287	297	307		327	337	347
	367	377			407			437	447
			487	497	507	517	527	537	547
557	567	577	587		607	617		637	647
657	667	677	687	697	707	717		737	743
757	767	777	787	797		817	827		

### Module 15: Comparing and ordering whole numbers (4)

#### Trial 1 Page 46

- 1 a Esi's friend Zinabu  
a  $940 - 359 = 581$
- 2 a Antwi  
b  $(834 - 298) = \text{Gh¢}536$
- 3 a last year  
b  $654 - 287 = 367$
- 4 a Mr. Mensah  
b  $768 - 500 = 268$
- 5 a Kyei  
b  $576 - 399 = 177$

#### Trial 2 Page 48

#### Can be expressed in another form by learners

- 1 Doe has a lot larger number of eraser than Amina
- 2 Seidu
- 3 Mr Ampadu
- 4 Esinam has a lot larger number of mangoes than Konadu.

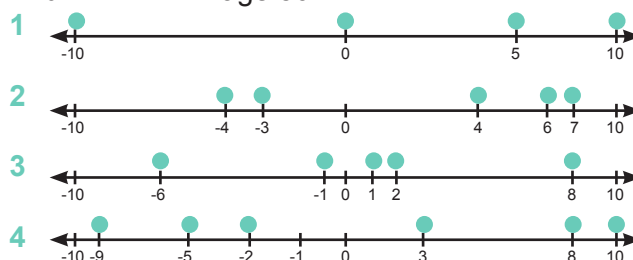
5 Efua saw a little more red cars than Dzifa.

### Module 16: Positive and negative number representation

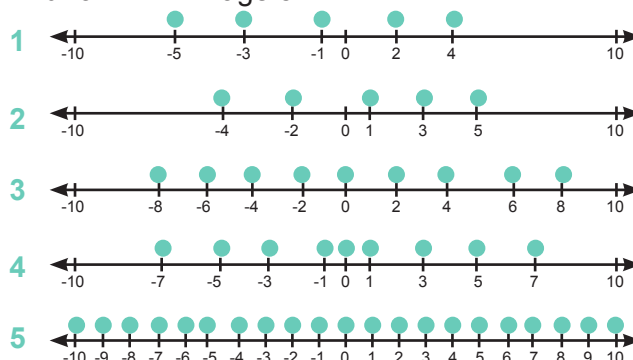
#### Trial 1 Page 49

- Eg.  $-3$   
 1  $+1$   
 2  $-5$   
 3  $+4$   
 4  $-6$   
 5  $+7\text{m}$

#### Trial 2 Page 50



#### Trial 3 Page 51



### Module 17: Describing situations using positive and negative values

#### Trial 1 Page 52

Learners to do these for discussion with facilitator

#### Trial 2 Page 53

Learners to do these for discussion



**Module 18: Counting forwards and backwards**
**Trial 1** Page 54

1 12 °C      2 8 °C  
3 4      4 2

**Trial 2** Page 55

1 6      2 2      3 0  
4 4      5 5

**Trial 3** Page 56

1 -3      2 -3      3 -4  
4 -5      5 -6

**Trial 4** Page 57

1 -9      2 -5      3 -2  
4 -3      5 -4

**Strand 1: Number**
**Sub-Strand 2: Number Operation (Addition, Subtraction, Multiplication and Division)**
**Module 1: Addition and subtraction facts (fluency 1).**
**Trial 1** Page 59

1 ? = 98 + 79      ? = 177  
2 ? = 638 + 78      ? = 716  
3 235 + ? = 624      624 - 235 = 389  
4 232 + ? = 586      586 - 232 = 354  
5 563 + ? = 874      874 - 563 = 311

**Trial 2** Page 60

1 658 - ? = 320  
? = 658 - 320  
? = 338  
2 493 - ? = 193      3 935 - ? = 720  
? = 493 - 193      ? = 935 - 720  
? = 300      ? = 215

4 98 - ? = 63  
? = 98 - 63  
? = 35

**Trial 3** Page 61

1 61      2 123  
3 635      4 206  
5 642

**Module 2: Addition and subtraction facts (fluency 2)**
**Trial 1** Page 62

1 85  
2 494  
3 783  
4 941  
5 923

**Trial 2** Page 63

1 213  
2 440  
3 537  
4 461  
5 280

**Trial 3** Page 64 & 65

1 43  
2 25  
3 151  
4 389  
5 369

**Module 3: Addition and subtraction**
**Trial 1** Page 66

Learners to do these for discussion

**Trial 2** Page 68

1 ≠      2 =      3 =  
4 ≠      5 =

**Trial 3** Page 68

Learners to do these for discussion with facilitator

**Module 4: Relationship between Addition and Subtraction**
**Trial 1** Page 69

1 84, 84      2 39, 39  
3 73, 73      4 58, 58  
5 87, 87

**Trial 2**

1 293; 352 + 293 = 645  
2 206; 276 + 206 = 482  
3 635; 218 + 635 = 853  
4 545; 438 + 545 = 983

## ANSWERS

<b>Trial 3</b>	Page 70
1	113; $35 + 113 = 148$
2	268; $263 - 43 = 225$
3	522; $326 + 522 = 848$
4	498; $498 - 142 = 356$
5	288; $438 + 288 = 726$

### Module 5: Addition strategies (1)

<b>Trial 1</b>	Page 71
1	5 $\longrightarrow$ a 8
2	4 $\longrightarrow$ f 7
3	3 $\longrightarrow$ e 9
4	6 $\longrightarrow$ b 7
5	6 $\longrightarrow$ d 12

### Trial 2

Eg.	9, 7, 4, 3	1	10, 9
2	7, 8	3	6, 8

In questions 1, 2, and 3, check on learners answers for the last two lines.

### Trial 3

Learners to do these for discussion

### Module 6: Addition strategies (2)

<b>Trial 1</b>	Page 74
1	55; $25 + 25 + 5 = 55$
2	64; $22 + 22 + 20 = 64$
3	54; $16 + 16 + 22 = 54$
4	89; $32 + 32 + 25 = 89$

### Trial 2

1	63
2	97
3	81
4	100
5	94

### Trial 3

1	63
2	72
3	80
4	53
5	82

### Module 7: Addition strategies (3)

The main conclusion strategies (5)					
Trial 1		Page 78			
1	92	2	82	3	95
4	95				

### Trial 2

1	283
2	417
3	527
4	313
5	720

### Trial 3

1	416	2	310	3	692
4	649	5	870		

### Module 8: Subtraction strategies (1)

Trial 1		Page 82			
1	26	2	34	3	36
4	17				

### Trial 2

1	33	2	32	3	25
4	40	5	51		

### Trial 3

1	$48 - 32 = 16$
2	$48 - 25 = 23$
3	$92 - 48 = 44$
4	$58 - 30 = 28$
5	$98 - 47 = 51$

### Module 9: Subtraction strategies (2)

Trial 1		Page 87			
1	43	2	16	3	38
4	15	5	32		

### Trial 2

1	29	2	37
3	33	4	38

### Module 10: Addition of 2 and 3 digit numbers

Trial 1		Page 91			
1	59	2	73	3	54
4	282	5	230		

### Trial 2

1	83	2	94
3	286	4	94

### Trial 3

1	389	2	593	3	618
4	911	5	465		

**Module 11: Subtraction of 2-and 3-digit numbers**
**Trial 1** Page 97

- 1  $75 - 38 = 37$   
 2  $85 - 58 = 27$   
 3  $358 - 58 = 300$   
 4  $262 - 47 = 215$

**Trial 2** Page 98

- 1 27      2 216  
 3 491      4 773

**Trial 3** Page 100

- 1 179      2 341  
 3 240      4 363  
 5 170

**Module 12: Addition of whole numbers (1)**
**Trial 1** Page 101

- 1 777  
 2 869  
 3 892

**Trial 2** Page 102

- 1 97      2 71  
 3 92      4 137  
 5 110      6 119

**Trial 3** Page 103

- 1 686  
 2 988  
 3  $652 + 45 = 697$   
 4  $547 + 160 = 707$

**Module 13: Addition of whole numbers (2)**
**Trial 1** Page 104

- 1 965      2 921  
 3 764      4 1085

**Trial 2** Page 105

- 1 295      2 421  
 3 541      4 744  
 5 602

**Trial 3** Page 107

- 1 153      2 257  
 3 728      4 121  
 5 900

**Module 14: Subtraction of whole numbers (1)**
**Trial 1** Page 109

- 1 231      2 318  
 3 217      4 388

**Trial 2** Page 111

- 1 84      2 322  
 3 421      4 284  
 5 419

**Trial 3** Page 112

- 1 110      2 595  
 3 295      4 362  
 5 676

**Module 15: Subtraction of whole numbers (2)**
**Trial 1** Page 114

- 1 109      2 339  
 3 355      4 278  
 5 507

**Trial 2** Page 115

- 1 Gh¢418.00      2 413      3 444

**Trial 3** Page 116

- 1 232      2 392      3 275  
 4 388      5 343

**Module 16: Word problems addition and subtraction**
**Trial 1** Page 117

Check on learners

**Trial 2** Page 119

Estimate be done by learners before adding.

**Trial 3** Page 121

Learners to do the estimation and work out

**Module 17: Commutative property of addition**
**Trial 1** Page 123

Learners to do these

**Trial 2** Page 125

Learners to do these for discussion with facilitator




## ANSWERS

### Module 18: Multiplication (1)

#### Trial 1 Page 126

- 1  $3 \times 2 = 6$       2  $4 \times 4 = 16$   
 3  $5 \times 6 = 30$       4  $3 \times 5 = 15$   
 5  $1 \times 7 = 7$

#### Trial 2 Page 128

- 1  $4 \times 3 = 12$   
 2  $2 \times 5 = 10$   
 3  $4 \times 6 = 24$    
 4  $2 \times 9 = 18$    
 5  $5 \times 7 = 35$  

### Module 19: Multiplication (2)

#### Trial 1 Page 130

- 1  $4 \times 5 = 20 = 5 \times 4$   
 2  $5 \times 3 = 15 = 3 \times 5$   
 3  $2 \times 7 = 14 = 7 \times 2$   
 4  $5 \times 6 = 30 = 6 \times 5$   
 5  $4 \times 8 = 32 = 8 \times 4$   
 6  $8 \times 3 = 24 = 3 \times 8$

#### Trial 2 Page 131

- 1  $4 \times 7 = 28$       2  $3 \times 8 = 24$   
 3  $3 \times 6 = 18$       4  $6 \times 11 = 66$   
 5  $6 \times 8 = 48$

#### Trial 3 Page 132

- 1 32      2 42  
 3 20      4 15  
 5 18

### Module 20: Multiplication 3

#### Trial 1 Page 133

x	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9
2	2	4	6	8	10	12	14	16	18
3	3	6	9	12	15	18	21	24	27
4	4	8	12	16	20	24	28	32	36
5	5	10	15	20	25	30	35	40	45
6	6	12	18	24	30	36	42	48	54
7	7	14	21	28	35	42	49	56	63
8	8	16	24	32	40	48	56	64	72
9	9	18	27	36	45	54	63	72	81

#### Trial 2 Page 134

- 1 4, 8, 12, 16, 20, 24, 28, 32  
 2  $a = 12$ ,  $b = 32$ ,  $c = 4$ ,  $d = 8$ ,  $e = 36$ ,  
 $f = 20$ ,  $g = 24$ ,  $h = 28$

#### Trial 3

- 1 30, 5, 48, 27, 6  
 2 28, 9, 4, 9, 9

#### Trial 4 Page 135

Learners to do these for discussion.

**Module 21: Multiplication (4)**
**Trial 1** Page 136

- 1  $8 + 8 + 8 = 24$   
 $8 \times 3 = 24$
- 2  $5 + 5 + 5 + 5 = 20$   
 $5 \times 4 = 20$
- 3  $2 + 2 + 2 + 2 = 8$   
 $2 \times 4 = 8$
- 4  $6 + 6 + 6 + 6 + 6 = 30$   
 $6 \times 5 = 30$

**Trial 2** Page 138

- 1  $\rightarrow c$       2  $\rightarrow b$   
 3  $\rightarrow e$       4  $\rightarrow a$

**Trial 3** Page 139

- 1  $5 + 5 = 10$   
 $2 \times 5 = 10$
- 2  $5 + 5 + 5 = 15$   
 $3 \times 5 = 15$
- 3  $5 + 5 + 5 + 5 = 20$   
 $4 \times 5 = 20$
- 4  $6 + 6 + 6 + 6 = 24$   
 $4 \times 6 = 24$

**Module 22: Division (1)**
**Trial 1** Page 140

- 1 5  
 2 9  
 3 4  
 4 8

**Trial 2** Page 143

- 1  $8 \div 4 = 2$       2  $15 \div 3 = 5$   
 3  $35 \div 5 = 7$       4  $28 \div 7 = 4$   
 5  $18 \div 2 = 9$  Drawing to be done by learners

**Trial 3** Page 145

- 1 36      2 9  
 3 4      4  $36 \div 4 = 9$

**Module 23: Division (2)**
**Trial 1** Page 147

- Eg.  $16 \div 2 = 8$       1  $20 \div 4 = 5$   
 2  $24 \div 4 = 6$       3  $9 \div 3 = 3$

**Trial 2** Page 148

- 1 4      2 5      3 6      4 5

**Module 24: Division (3)**
**Trial 1** Page 149

- 1 56, 8, 56      2 2, 6, 6  
 3 45, 9, 5      4 7, 49, 7  
 5 54, 6, 54

**Trial 2**

- 1 6      2 3  
 3 6      4 4  
 5 8      6 4

**Strand 1: Number**
**Sub-strand 3: fractions**
**Module 1: Unit fractions**
**Trial 1** Page 151

- 1  $\frac{1}{4}$       2  $\frac{1}{8}$       3  $\frac{1}{6}$
- 4  $\frac{1}{5}$       5  $\frac{1}{2}$

**Trial 2** Page 152

- 1  $\frac{1}{4}$       2  $\frac{1}{5}$       3  $\frac{1}{8}$
- 4  $\frac{1}{7}$       5  $\frac{1}{10}$       6  $\frac{1}{6}$

**Module 2: Multiples of unit fractions**
**Trial 1** Page 153

Learners to do colouring in different ways

**Trial 2** Page 154

- 1  $\frac{3}{6}$       2  $\frac{5}{20}$       3  $\frac{8}{48}$
- 4  $\frac{5}{40}$       5  $\frac{6}{18}$

**Trial 3** Page 155

1	0	$\frac{1}{4}$	$\frac{2}{4}$	$\frac{3}{4}$	$\frac{4}{4}$	$\frac{5}{4}$	$\frac{6}{4}$	$\frac{7}{4}$	$\frac{8}{4}$	$\frac{9}{4}$
2	$\frac{5}{8}$	$\frac{6}{8}$	$\frac{7}{8}$	$\frac{8}{8}$	$\frac{9}{8}$	$\frac{10}{8}$	$\frac{11}{8}$	$\frac{12}{8}$	$\frac{13}{8}$	$\frac{14}{8}$
3	$\frac{1}{3}$	$\frac{2}{3}$	$\frac{3}{3}$	$\frac{4}{3}$	$\frac{5}{3}$	$\frac{6}{3}$	$\frac{7}{3}$	$\frac{8}{3}$	$\frac{9}{3}$	$\frac{10}{3}$

## ANSWERS

4  $\frac{4}{7}$   $\frac{5}{7}$   $\frac{6}{7}$   $\frac{7}{7}$   $\frac{8}{7}$   $\frac{9}{7}$   $\frac{10}{7}$   $\frac{11}{7}$   $\frac{12}{7}$   $\frac{13}{7}$

5  $\frac{1}{10}$   $\frac{2}{10}$   $\frac{3}{10}$   $\frac{4}{10}$   $\frac{5}{10}$   $\frac{6}{10}$   $\frac{7}{10}$   $\frac{8}{10}$   $\frac{9}{10}$   $\frac{10}{10}$

### Trial 4 Page 156

1  $\frac{1}{7}$   $\frac{2}{7}$   $\frac{3}{7}$   $\frac{4}{7}$   $\frac{5}{7}$   $\frac{6}{7}$   $\frac{7}{7}$   $\frac{8}{7}$

2  $\frac{1}{5}$   $\frac{2}{5}$   $\frac{3}{5}$   $\frac{4}{5}$   $\frac{5}{5}$   $\frac{6}{5}$   $\frac{7}{5}$   $\frac{8}{5}$

3  $\frac{1}{8}$   $\frac{2}{8}$   $\frac{3}{8}$   $\frac{4}{8}$   $\frac{5}{8}$   $\frac{6}{8}$   $\frac{7}{8}$   $\frac{8}{8}$

4  $\frac{1}{9}$   $\frac{2}{9}$   $\frac{3}{9}$   $\frac{4}{9}$   $\frac{5}{9}$   $\frac{6}{9}$   $\frac{7}{9}$   $\frac{8}{9}$   $\frac{9}{9}$

### Module 3: Fractions of a group

#### Trial 1 Page 157

1 b  $\frac{1}{3}$       2 c  $\frac{1}{2}$       3 a  $\frac{4}{6}$

#### Trial 2 Page 158

1  $\frac{5}{10}$       2  $\frac{8}{12}$       3  $\frac{7}{11}$

4  $\frac{4}{6}$       5  $\frac{8}{9}$

#### Trial 3 Page 159

To be done by learners in different ways

### Module 4: Comparing and ordering unit fractions

#### Trial 1

1  $\frac{3}{4}$       2  $\frac{2}{3}$

3  $\frac{5}{6}$       4  $\frac{4}{5}$  is larger

5  $\frac{2}{3}$  is larger

#### Trial 2 Page 161

1  $\frac{2}{3}$       2  $\frac{2}{5}$       3  $\frac{3}{4}$

4  $\frac{4}{6}$

5  $\frac{1}{2}$

6  $\frac{4}{5}$

### Trial 3 Page 163

1  $\frac{4}{8}$   $\frac{3}{5}$  and  $\frac{2}{3}$

2  $\frac{8}{10}$   $\frac{7}{8}$  and  $\frac{6}{6}$

3  $\frac{3}{10}$   $\frac{1}{2}$  and  $\frac{3}{4}$

4  $\frac{2}{4}$   $\frac{2}{5}$  and  $\frac{3}{8}$

5  $\frac{4}{5}$   $\frac{4}{6}$  and  $\frac{4}{10}$

6  $\frac{2}{2}$   $\frac{1}{3}$  and  $\frac{2}{8}$

### Strand 1: Number

#### Sub-strand 4: Money

#### Module 1: Paying the exact amount

#### Trial 1 Page 164

To be done by learners in different ways

#### Trial 2 Page 166

1 one Gh¢20 + one Gh¢5 + one 50p

2 one Gh¢20 + one Gh¢10 + one Gh¢5 + one Gh¢2

3 one Gh¢50 + one Gh¢20 + one Gh¢5

4 two Gh¢20 + one Gh¢5 + one Gh¢2 + one Gh¢1 + 20p + 10p

5 one Gh¢50 + one Gh¢20 + one 10p + one 5p

#### Trial 3 Page 168

To be done by learners in different ways

#### Trial 4 Page 169

Learners do these for discussion with facilitators



**Module 2: Taking change**

**Trial 1** Page 170

- 1 Gh¢ 13.00      2 Gh¢ 14.20  
3 Gh¢ 3.75      4 Gh¢ 34.25  
5 Gh¢ 7.40

**Trial 2** Page 171

- 1 Total: Gh¢25.85      Change: Gh¢4.15  
2 Total: Gh¢9.20      Change: Gh¢0.80  
3 Total: Gh¢78.00      Change: Gh¢22.00  
4 Detergent: Gh¢17.20      Cash: Gh¢20.00  
5 Drinks: Gh¢15.00      Cash: Gh¢50.00

**Strand 2: Algebra**

**Sub-Strand 1: Patterns and Relationships**

**Module 1: Increasing and decreasing patterns**

**Trial 1** Page 174

- 1 20, 31      2 63, 55  
3 86, 71      4 19, 46  
5 52, 67

**Trial 2** Page 175

- 1 73, 77, 81      2 55, 61, 67  
3 44, 36, 28, 20      4 40, 31, 22  
Rule: Subtract 9  
5 67, 72, 77  
Rule: Add 5

**Trial 3** Page 173

- 1 42, 46, 50, 54, 58, 62  
2 73, 69, 65, 61, 57, 53  
3 91, 84, 77, 70, 63, 56  
4 28, 36, 44, 52, 60, 68  
5 2, 4, 8, 16, 32, 64

**Module 2: Errors in a patterns**

**Trial 1** Page 177

- 1 50, 65, 75  
2 80, 50, 40  
3 47, 39, 23, 7  
4 70, 82, 88  
5 73, 81, 89  
6 99, 91, 83, 71

**Trial 2** Page 178

- 1 80 + 5      Error 84  
2 63 – 10      Error 43  
3 80 + 15      Error 85  
4 25 – 8      Error 19

**Module 3: Increasing and decreasing patterns**  
(100 number chart)

**Trial 1** Page 179

- 1 Multiple of 11: 11, 22, 33, 44, 55, 66, 77, 88, 99  
2 99, 88, 77, 66, 55, 44, 33, 22, 11  
3 Multiples of 5: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 100  
4 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100

**Trial 2** Page 180

- 1 85, 90, 95  
an increasing pattern  
2 66, 58, 50  
a decreasing pattern  
3 43, 36, 29  
a decreasing pattern  
4 72, 81, 90  
an increasing pattern  
5 75, 86, 97  
an increasing pattern

**Strand 3: Geometry and measurement**

**Sub-strand 1: 2D shapes and 3D objects**

**Module 1: Describing solid shapes (1)**

**Trial 1** Page 182

- 1 cylinder      2 cube  
3 pyramid      4 cuboid  
5 cone      6 prism

**Trial 2** Page 183

- 1 → sphere      2 → cuboid  
3 → cylinder      4 → cube  
5 → prism      6 → cone

**Trial 3** Page 184

- 1 cone      2 cuboid  
3 cylinder      4 cube  
5 prism

**Module 2: Regular and irregular shapes**

**Trial 1** Page 185

Learners to do this

**Trial 2** Page 186

Learners can do these in many different ways

## ANSWERS

### Trial 3 Page 187

- |   |                   |   |                    |
|---|-------------------|---|--------------------|
| 1 | Triangle          | 2 | Regular hexagon    |
| 3 | Regular pentagon  |   |                    |
| 4 | Rectangle         | 5 | Irregular pentagon |
| 6 | Regular octagon   |   |                    |
| 7 | Irregular hexagon | 8 | semicircle         |

### Module 3: Angles

#### Trial 1 Page 188

Right angles - 1, 6 and 8

#### Trial 2 Page 189

Learners to do this

### Module 4: Angles that are right angles

#### Trial 1 Page 190

For discussion –learners and facilitators

#### Trial 2 Page 191

Learners do these for discussion with facilitators

### Module 5: Quadrilaterals

#### Trial 1 Page 192

Quadrilaterals (✓) –1, 2, 4 and 6

Not Quadrilaterals (x) –3, 5, 7 and 8

#### Trial 2 Page 193

- |   |               |     |
|---|---------------|-----|
| 1 | Parallelogram | → d |
| 2 | Rectangle     | → c |
| 3 | Trapezium     | → b |
| 4 | Rhombus       | → e |
| 5 | Square        | → a |

#### Trial 3 Page 194

- |   |               |
|---|---------------|
| 1 | Square        |
| 2 | Rectangle     |
| 3 | Kite          |
| 4 | Rhombus       |
| 5 | Trapezium     |
| 6 | Parallelogram |

### Strand 3: Geometry and measurement

#### Sub-strand 2: Position/Transformation

##### Module 1: Positioning

#### Trial 1 Page 195

3 and 5

#### Trial 2 Page 196

Check on learners' answers

### Sub-Strand 3: Measurement –Length, Mass and Capacity

#### Module 1: Measurement of length

##### Trial 1 Page 197

- |   |       |   |       |
|---|-------|---|-------|
| 1 | Three | 2 | Eight |
| 3 | Four  | 4 | Four  |
| 5 | One   |   |       |

##### Trial 2 Page 198

- |   |          |   |           |   |          |
|---|----------|---|-----------|---|----------|
| 1 | BD = 7cm | 2 | AC = 5cm  | 3 | DF = 5cm |
| 4 | CD = 4cm | 5 | AF = 14cm | 6 | CF = 9cm |

#### Module 2: Measurement of length (relationship between cm and m)

##### Trial 1 Page 199

- |   |             |    |             |
|---|-------------|----|-------------|
| 1 | cm          | 2  | m           |
| 3 | m           | 4  | cm          |
| 5 | cm          | 6  | cm          |
| 7 | metres      | 8  | centimetres |
| 9 | centimetres | 10 | metre       |

##### Trial 2 Page 200

#### Learners to do these

- |   |          |   |           |   |          |
|---|----------|---|-----------|---|----------|
| 1 | AB = 4cm | 2 | AD = 10cm | 3 | EG = 7cm |
| 4 | HK = 3cm | 5 | CD = 4cm  | 6 | JK = 9cm |

#### Module 3: Measurement of length (relationship between cm and m)

##### Trial 1 Page 201

Learners to do these

### Module 4: Perimeter

##### Trial 1 Page 202

- |   |      |   |      |
|---|------|---|------|
| 1 | 12cm | 2 | 20cm |
| 3 | 12cm | 4 | 6cm  |

##### Trial 2 Page 203

#### Addition can be done in different ways

- |   |                             |
|---|-----------------------------|
| 1 | $3 + 3 + 4 + 4 = 14$ cm     |
| 2 | $8 + 4 + 4 + 4 = 20$ cm     |
| 3 | $7 + 5 + 3 + 3 + 6 = 24$ cm |
| 4 | $5 + 5 + 5 = 15$            |

**Trial 3** Page 204

Shape	Estimate	Actual
Hexagon	Learners' answer	12cm
Square	Learners' answer	12cm
Rectangle	Learners' answer	12cm
Triangle	Learners' answer	12cm

**Module 5:** Measurement of mass (relationship between kilogram and gram; litres and millilitres)

**Trial 1** Page 205

- |      |      |
|------|------|
| 1 kg | 2 g  |
| 3 kg | 4 g  |
| 5 kg | 6 kg |
| 7 kg | 8 g  |

**Trial 2** Page 206

To be done by learners

**Module 6:** Estimate mass and volume

**Trial 1** Page 207

- |      |      |
|------|------|
| 1 ml | 2 l  |
| 3 ml | 4 l  |
| 5 l  | 6 ml |
| 7 ml | 8 l  |

**Trial 2** Page 208

To be done by learners

**Module 7:** Measurement of time

**Trial 1** Page 209

To be done by learners

**Trial 2** Page 210

- |          |          |
|----------|----------|
| 1 20mins | 2 35mins |
| 3 40mins | 4 45mins |
| 5 80mins | 6 45mins |

**Trial 2** Page 211

- 1 1hr or 60mins
- 2 20mins
- 3 1hr 15mins or 75mins
- 4 1hr 30mins or 90mins
- 5 1hr 30mins or 90mins

**Trial 4** Pages 212 and 213

1 2hrs 30mins or  $2\frac{1}{2}$  hrs or 150mins

2hrs 15mins or  $2\frac{1}{4}$  hrs or 135mins

1hr 50mins or 110mins

2hrs 45mins or  $2\frac{3}{4}$  hrs or 165mins

- 2 a 4<sup>th</sup> bus
- b 3<sup>rd</sup> bus
- c 55mins
- d 4:45pm
- e 4: 25pm

**Module 8:** Reading the calendar

**Trial 1** Pages 214 and 215

- 1 Tuesday
- 2 Thursday
- 3 10
- 4 Friday
- 5 12
- 6 January and October 2019

**Trial 2** Page 216

- 1 4<sup>th</sup> April
- 2 1<sup>st</sup> July
- 3 6<sup>th</sup> June
- 4 24<sup>th</sup> June
- 5 28<sup>th</sup> August
- 6 5<sup>th</sup> October

**Trial 3** Page 217

- 1 February
- 2 July
- 3 June
- 4 November
- 5 Friday
- 6 April, June, September, November

**Module 9:** Solving problems with time

**Trial 1** Page 218

- 1 minutes
- 2 days
- 3 second
- 4 hours
- 5 months
- 6 weeks

**Trial 2** Page 219

- |                 |               |
|-----------------|---------------|
| 1 a 120 seconds | b 180 seconds |
| 2 a 120 minutes | b 300 minutes |

## ANSWERS

- 3 a 72 hours b 120 hours  
 4 3 days  
 5 156 minutes

### Strand 4: Data

**Sub-Strand 1:** Data Collection, Organization, Interpretation, Presentation and Analysis

**Module 1:** Gathering and organizing data

**Trial 1** Page 222

1

Sports	Tally
Football	
Volleyball	
Tennis ball	

- 2 20, 10, 17

**Trial 2** Page 223

- 1 18 2 11  
 3 Ampe 4 139  
 5 Ludo

**Trial 3** Page 224

- 1 81 2 19  
 3 44 4 8  
 5 English

**Module 2:** Drawing and interpreting graphs

**Trial 1** Page 225

Learners to do this

**Trial 2** Page 226

Learners can do this using different scales on the vertical axis and different width of bars on the horizontal axis

**Trial 3** Page 226

- 1 14 2 week 3  
 3 16 4 8  
 5 38

# ESSENTIAL Mathematics Primary 3

Teacher's Guide

**ESSENTIAL Mathematics Primary Book 3** is written to meet the full requirements of the current New Standards-based curriculum by the National Council for Curriculum and Assessment (**NaCCA**) with a problem-solving and discovery approach to the learning of Mathematics.

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