

# ESSENTIAL



# Mathematics

## Primary 2

Teacher's Guide



CAMBRIDGE



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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 and Ordinality				
Module	Lessons	LB page numbers	WB page numbers	TG page numbers
<b>Module 1:</b> Number names	<b>Lesson 1:</b> Number names one - twenty <b>Lesson 2:</b> Number Name (Twenty – One Hundred) <b>Lesson 3:</b> Number Name (100 – 1000)	10 - 15	2 - 4	2 2 - 3 3
<b>Module 2:</b> Counting sequence	<b>Lesson 1:</b> Skip count forward by 2s (1– 60). <b>Lesson 2:</b> Skip count backwards by 2s (60 - 1). <b>Lesson 3:</b> Skip count forwards by 5s. <b>Lesson 4:</b> Skip count backwards by 5s (500 – 100) <b>Lesson 5:</b> Skip count forwards by 10s (100 – 1000) <b>Lesson 6:</b> Skip count backwards by 10s (1000 – 100)	16 - 23	5 - 7	4 4 -5 5 5 -6 6 6 - 7
<b>Module 3:</b> Counting to find “how many”	<b>Lesson 1:</b> Counting by 2s to find “How Many” <b>Lesson 2:</b> Counting by 5s to find “How Many” <b>Lesson 3:</b> Counting in 10s to find “How Many.	24 - 28	8 - 10	8 8 - 9 9
<b>Module 4:</b> Representing Quantities with Numerals	<b>Lesson 1:</b> Representing quantities of objects with numerals (1 – 100) <b>Lesson 2:</b> Representing Quantities with numeral (100 – 1000)	29 - 32	11 - 12	10 11
<b>Module 5:</b> Estimating quantities	<b>Lesson 1:</b> Finding Estimates	33 - 35	13 - 14	12
<b>Module 6:</b> Describing the Position of Numbers	<b>Lesson 1:</b> Describing position of numbers.	36 - 38	15 - 17	13
<b>Module 7:</b> Using non-standard units for measuring (1)	<b>Lesson 1:</b> Counting to find “How long” (using objects) <b>Lesson 2:</b> Counting to find “How long” using (using body parts)	39 - 42	18 - 20	14 15
<b>Module 8:</b> Using non-stand and ... (2)	<b>Lesson 1:</b> Counting to find “How Much?”.	43 - 44	21	16

<b>Module 9:</b> Place Value	<b>Lesson 1:</b> Place value of 2-digit numbers <b>Lesson 2:</b> Place Value of 3-digit numbers	45 - 48	22 - 24	17 18
<b>Module 10:</b> Partitioning of whole Numbers	<b>Lesson 1:</b> Partitioning of 2-digit numbers <b>Lesson 2:</b> Partitioning of 3-digit numbers	49 - 52	25 - 26	19 19 - 20
<b>Module 11:</b> Describing numbers in equivalent ways	<b>Lesson 1:</b> Numbers more than or less than <b>Lesson 2:</b> Describing numbers in Equivalent Ways	53 - 55	27 - 28	21 22
<b>Module 12:</b> Arranging objects in Different ways	<b>Lesson 1:</b> Equal Groupings of objects <b>Lesson 2:</b> Grouping objects with left overs.	56 - 60	29 - 31	23 24
<b>Module 13:</b> Comparing whole numbers using the symbol $>$ , $<$ or $=$	<b>Lesson 1:</b> Comparing 2 Numbers	61 - 62	32 - 33	25
<b>Module 14:</b> Ordering whole numbers	<b>Lesson 1:</b> Ordering numbers	63 - 65	34 - 35	26
<b>Module 15:</b> Finding missing numbers	<b>Lesson 1:</b> Finding missing numbers using the number line <b>Lesson 2:</b> Finding missing numbers using the 100 number chart	66 - 69	36 - 37	27 28
<b>Module 16:</b> Word Problem Involving Comparison	<b>Lesson 1:</b> Word problem (comparison)	70 - 72	38 - 39	29 - 30

Strand 1: Number Sub-strand 2: Number Operations (Addition, Subtraction, Multiplication and Division)				
Module	Lessons	LB page numbers	WB page numbers	TG page numbers
<b>Module 1:</b> Addition of whole numbers.	<b>Lesson 1:</b> Adding 2 numbers in any order <b>Lesson 2:</b> Adding 3 numbers in any order	76 - 78	40 - 41	31 32
<b>Module 2:</b> Adding or subtracting zero	<b>Lesson 1:</b> Adding or Subtracting Zero (0) from a number	79 - 81	42 - 43	33
<b>Module 3:</b> Finding Missing numbers.	<b>Lesson 1:</b> Finding the missing addend <b>Lesson 2:</b> Finding the missing subtrahend <b>Lesson 2:</b> Finding the missing minuend	82 - 85	44 - 46	34 35 35 - 36
<b>Module 4:</b> Addition and subtraction word problem.	<b>Lesson 1:</b> Creating addition sentence and word problems for a given solution/answer. <b>Lesson 2:</b> Creating subtraction sentences and word problems for a given solution	86 - 90	47 - 49	37 - 38 38
<b>Module 5:</b> Addition and subtraction of whole numbers using “= and ≠” signs	<b>Lesson Lesson 1:</b> Addition of whole numbers (sum up to 100) <b>Lesson 2:</b> Subtraction of whole numbers (within 100)	91 - 93	50 - 52	39 - 40 40
<b>Module 6:</b> Relationship between addition and subtraction	<b>Lesson 1:</b> Changing Addition sentences to subtraction sentences <b>Lesson 2:</b> Changing Subtraction sentences into addition Sentences.	94 - 96	53 - 55	41 - 42 42
<b>Module 7:</b> Addition and subtraction facts (fluency 1)	<b>Lesson 1:</b> Addition Facts (1, 2 or 10 less than/more than).	97 - 99	56 - 57	43
<b>Module 8:</b> Double of numbers (1 – 12)	<b>Lesson 1:</b> Finding doubles of numbers	100 - 101	58 - 59	44
<b>Module 9:</b> Addition and subtraction facts (fluency 2)	<b>Lesson 1:</b> Number bond for 10 <b>Lesson 2:</b> Number bonds for 15, 19, 20)	102 - 105	60 - 61	45 46

<b>Module 10:</b> Addition and subtraction facts (fluency 3)	<b>Lesson 1:</b> Addition (making 10s to add) <b>Lesson 2:</b> Addition (making doubles '+' to add) <b>Lesson 3:</b> Addition (making doubles '-' to add)	106 - 110	62 - 64	47 47 - 48 48
<b>Module 11:</b> Subtraction strategies	<b>Lesson 1:</b> Subtraction (counting down) <b>Lesson 2:</b> Changing subtraction sentence into addition sentence.	111 - 114	65 - 66	49 50
<b>Module 12:</b> Addition of whole numbers (sum up to 100)	<b>Lesson 1:</b> Addition without regrouping. <b>Lesson 2:</b> Addition with regrouping	115 - 120	67 - 69	51 52
<b>Module 13:</b> Subtraction of whole numbers (within 100)	<b>Lesson 1:</b> Subtraction without regrouping <b>Lesson 2:</b> Subtraction with Regrouping.	121 - 123	70 - 72	53 - 54 54
<b>Module 14:</b> Personal strategy for addition (1)	<b>Lesson 1:</b> Addition using decomposition strategy <b>Lesson 2: Addition using friendly Jumps</b>	124 - 127	73 - 75	55 56
<b>Module 15:</b> Personal strategies for addition (2)	<b>Lesson 1:</b> Addition using moving part strategy <b>Lesson 2:</b> Addition using "compensation strategy"	128 - 130	76 - 78	57 58
<b>Module 16:</b> Personal strategies for subtraction (1)	<b>Lesson 1:</b> Subtraction "Using counting on" <b>Lesson 2:</b> Subtraction (using incrementing strategy) <b>Lesson 3:</b> Subtraction (using decomposition strategy)	131 - 133	79 - 81	59 60 61 - 62
<b>Module 17:</b> Personal Strategies for Subtraction (2)	<b>Lesson 1:</b> Subtraction (using compensation) <b>Lesson 2:</b> Subtraction (Using friendly jumps). <b>Lesson 3:</b> Subtraction (using constant differences)	134 - 138	82 - 85	62 - 63 63 64
<b>Module 18:</b> Word problem involving addition (up to 100)	<b>Lesson 1:</b> Addition word problem (using place value) <b>Lesson 2:</b> Addition word problem (using decomposition strategy)	139 - 142	86 - 89	65 - 66 66



<b>Module 19:</b> Word problem involving subtraction (within 100)	<b>Lesson 1:</b> Subtraction (using place value) <b>Lesson 2:</b> Changing subtraction sentences to addition sentences. <b>Lesson 3:</b> Subtraction using compensation	143 - 147	90 - 94	67 68 68 - 69
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**Strand 1: Number**  
**Sub-strand 3: Fractions**

Module	Lessons	LB page numbers	WB page numbers	TG page numbers
<b>Module 1:</b> Making halves	<b>Lesson 1:</b> Making halves. <b>Lesson 2:</b> Counting Halves	151 - 154	95 - 96	70 70 - 71
<b>Module 2:</b> Making quarters	<b>Lesson 1:</b> Making quarters <b>Lesson 2:</b> Counting quarters	155 - 158		72 72 - 73
<b>Module 3:</b> Halves and quarters of an amount	<b>Lesson 1:</b> Identifying half of amount (1) <b>Lesson 2:</b> Identifying half of amount (2) <b>Lesson 3:</b> Identifying quarter of amount (1) <b>Lesson 4:</b> Identifying quarter of amount (2)	159 - 162	100 - 101	74 75 75 76

**Strand 1: Number**  
**Sub-strand : Money**

Module	Lessons	LB page numbers	WB page numbers	TG page numbers
<b>Module 1:</b> Recognising Ghanaian coins and notes by name	<b>Lesson 1:</b> identifying the Ghana pesewa coins. <b>Lesson 2:</b> identifying 1, 2 and 5 Ghana cedi notes <b>Lesson 3:</b> Identifying the 10, 20 and 50 Ghana cedi notes	165 - 168	102 - 103	77 78 78
<b>Module 2:</b> Relationship among the Ghana cedi notes	<b>Lesson 1:</b> Relationship among the Ghana cedi notes (1) <b>Lesson 2:</b> Relationship among the Ghana cedi notes (2)	169 - 172	104 - 106	79 80

**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 number patterns	<b>Lesson 1:</b> Increasing number patterns <b>Lesson 2:</b> Decreasing number pattern	176 - 181	108 - 110	82 82
<b>Module 2:</b> Identifying errors/omissions in patterns	<b>Lesson 1:</b> Identifying Errors in patterns increasing by 2s <b>Lesson 2:</b> Identifying Errors in patterns decreasing by 5s <b>Lesson 3:</b> Identifying errors in patterns increasing by 10	182 - 184	111 - 112	83 83 - 84 84
<b>Module 3:</b> Finding missing terms in pattern	<b>Lesson 1:</b> Repeated addition pattern <b>Lesson 2:</b> Repeated subtraction pattern	185 - 186	113 - 114	85 85 - 86
<b>Module 4:</b> Identifying and describing rules for patterns	<b>Lesson 1:</b> Finding rules for addition patterns <b>Lesson 2:</b> Finding rules for subtraction patterns <b>Lesson 3:</b> Finding rules for arrays of objects	187 - 190	115 - 118	87 87 - 88 88

**Strand 3: Geometry and Measurement****Sub-Strand 1: 2D and 3D Shapes**

Module	Lessons	LB page numbers	WB page numbers	TG page numbers
<b>Module 1:</b> Recognizing and naming 3D objects	<b>Lesson 1:</b> 3D Objects: Recognizing and naming 3D objects <b>Lesson 2:</b> Attributes of a cube and a cuboid <b>Lesson 3:</b> Attributes of a cylinder and a cone <b>Lesson 4:</b> Attributes of a sphere <b>Lesson 5:</b> Comparing 3D objects	194 - 199	120 - 121	90 90 - 91 91 91 - 92 92
<b>Module 2:</b> Sorting 3D shapes	<b>Lesson 1:</b> Sorting 3Ds by type <b>Lesson 2:</b> Sorting 3Ds by colour	200 - 201	122 - 123	93 93 - 94
<b>Module 3:</b> Identifying 2D shapes	<b>Lesson 1:</b> Identifying 2D shapes <b>Lesson 2:</b> Identifying 2D shapes	202 - 206	124 - 126	95 95 - 96

<b>Module 4:</b> Sorting 2D shapes	<b>Lesson 1:</b> Sorting 2D shapes by type <b>Lesson 2:</b> Sorting 2D shapes by colour	207 - 209	127 - 128	97 97 - 98
<b>Module 5:</b> identifying 2D shapes in everyday objects	<b>Lesson 1:</b> Identifying 2D shapes in everyday objects	210 - 211	129	99 - 100

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

Module	Lessons	LB page numbers	WB page numbers	TG page numbers
<b>Module 1:</b> Different orientations of shapes	<b>Lesson 1:</b> Describing different orientations of shapes (1) <b>Lesson 2:</b> Describing different orientations of shapes (2)	214 - 216	131 - 132	101 102

**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> Measuring Lengths	<b>Lesson 1:</b> Comparing length (1) <b>Lesson 2:</b> Comparing length (2)	218 - 220	133 - 134	103 103 -104
<b>Module 2:</b> Measuring Mass	<b>Lesson 1:</b> Comparing the weight of objects (1) <b>Lesson 2:</b> Comparing weight of objects (2)	221 - 224	135 - 136	105 106
<b>Module 3:</b> Measuring capacity .	<b>Lesson 1:</b> Comparing capacity (1) <b>Lesson 2:</b> Comparing capacity (2)	225 - 227	137 - 138	107 108
<b>Module 4:</b> Comparing 3 or more objects.	<b>Lesson 1:</b> Comparing 3 or more objects	228 - 231	139 - 141	109
<b>Module 5:</b> Standard unit for measuring length	<b>Lesson 1:</b> Using standard unit for length (1) <b>Lesson 2:</b> Using standard unit for length (2)	232 - 234	142 - 143	110 111
<b>Module 6:</b> Reading the calendar	<b>Lesson 1:</b> Reading the calender (January - June) <b>Lesson 2:</b> Reading the calender (July - December)	235 - 238	144 - 145	112 113

<b>Module 7:</b> Measuring time using arbitrary units	<b>Lesson 1:</b> Measuring time using arbitrary units (1) <b>Lesson 2:</b> Measuring time using arbitrary units (2)	239 - 241	146 - 147	114 115
<b>Module 8:</b> Relationship between units of time	<b>Lesson 1:</b> Relationship between units of time (1) <b>Lesson 2:</b> Relationship between units of time (2) <b>Lesson 3:</b> Relationship between units of time (3) <b>Lesson 4:</b> Time, days, weeks, months and years.	242 - 247	148 - 152	116 116 - 117 117 117 - 118

**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> Collecting and organising data	<b>Lesson 1:</b> Collecting data (objects) <b>Lesson 2:</b> Collecting data (tally)	252 - 256	154 - 156	120 121
<b>Module 2:</b> Interpretation of graphs	<b>Lesson 1:</b> Interpretation of graphs 1 <b>Lesson 2:</b> Interpretation of graphs 2	257 - 262	157 - 161	122 123

## INTRODUCTION

The aim of the primary Mathematics curriculum is to provide learners with opportunities to further their Mathematical knowledge and skills and ensure 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 2: 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 2 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 2 Mathematics learner

Teachers are to focus on the four critical areas of the B2 curriculum, and in doing so, they have to achieve all the content standards through the indicators.

Teachers should ensure that B2 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, counting sequences and how to count to find out “how many?”.
- Identify numbers in different positions around a given number in a number chart. (1-1000).
- Use number names and non-standard units (marked 10s and 1s) for measuring (lengths and volumes) to count to find out “how long or how much?” up to 999.
- Demonstrate a conceptual understanding of place value of whole numbers between 0 and 1000.
- Represent number quantities up to 1000 in equivalent ways focusing on place value and equality.
- Use place value to compare and order whole numbers up to 1000 using comparative symbols ( $>$ ,  $<$ , or  $=$ ).

***Number Operations***

- Use conceptual understanding of addition and subtraction up to 100.
- Use the concept of “equal to” and “not equal to” to solve addition and subtraction problems with sums up to 100.
- Use mental strategies for basic addition facts and related subtraction facts up to 19.
- Use conventional strategies to add and subtract within 100.
- Use strategies for solving basic addition facts (and related subtraction fact) to 10.
- Use personal strategies to add and subtract within 100.
- Solve one-step and multi-step word problems involving addition and subtraction within 100 using a variety of strategies based on place value.

***Fractions***

- Understand the fraction “one-half” and “one-quarter” as the quantity obtained by taking 1 part when a whole is partitioned in halves and quarters (fourths).
- Count in halves and quarters (fourths) using concrete and pictorial representations of halves and fourths.

- Determine the number of halves and quarters in a whole

***Money***

- Recognise Ghanaian coins, and currency notes and determine the values of a collection of coins and notes up to 50 Ghana cedis.

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

- Demonstrate an understanding of increasing and decreasing number patterns
- Identify, create and describe the rule for simple number patterns involving repeated addition or subtraction, skip counting and arrays of objects.

**GEOMETRY AND MEASUREMENT**

- Identify the common features or attributes of a collection of 3D objects (spheres, cylinders, cones, pyramids, cubes) of different dimensions or orientations.
- Identify the common features or attributes of a collection of 2D shapes (squares, triangles, rectangles, circles, pentagons, hexagons) of different dimensions or orientations
- Create two-dimensional shapes based on given attributes, including number of sides and vertices.
- Prove that the placement or direction of a shape or object does not change its length.
- Demonstrate an understanding of how to measure lengths, capacities or mass - directly or indirectly - using nonstandard units
- Develop an understanding of measuring as a process of comparing three or more items
- Recognise the need for standard unit of measurement of length
- Read the calendar and solve problems involving the number of days in a week and number of months in a year.
- Use arbitrary units and hour on the clock to measure time to complete simple events.

**DATA**

- Use tallies, checkmarks, charts, lists or objects to collect and organize data

to answer and pose questions about themselves, others, or surroundings.

- Draw and interpret concrete graphs and pictographs.

### Expectations of a Basic 2 Teacher

If learners are to meet the expectations of the B1 curriculum, teachers will need to:

- 1 Have a mastery of the content standards and the indicators in the B2 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 2
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 12

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.

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

**Learner's Book page 16**  
**Workbook page 5**

**Module 2:** Counting Sequence

**Content Standard**  
B2.1.1.1: Count and estimate quantities from 0 to 1000.

**Indicator**  
B2.1.1.1.1: Use number names, counting sequences and how to count to find out "how many?"

**Learning Expectation**  
Learners will be able to count from 1-60.

**Essentials for Learning**  
Learners can count from 1-20.

**New words**  
One, two–twenty, skip count, count, tens, fives.

**Resources**  
Numeral cards 0 to 20, 100 number chart, number line (0 and 20).

**Number of Lessons** 6

**Lesson 1:** Skip count forward by 2s (1– 60)

**Starter**  
Play: "Counting forward and backwards" (1 – 20).

**Find Out**  
Refer to Learner's Book page 16. Learners look at the boy and describe what he is doing. The boy is counting by 2s starting from 202, 204,...

**Let us Learn**

- Put learners into groups of 5. Give out number line cards to learners. They skip count by 2s from 1 to 20. Make sure every learner gets a turn to take part.
- Give out the 100-number charts to learners in pairs. They skip count forward by 2s from any number up to 60.
- Refer learners to the Learner's Book page 16. Go through the exercise with learners.
- Have learners skip count forwards by 2s up to 60. Learners say the shaded numbers aloud.

**Review Exercise**

**Differentiated Lessons**

**Low-ability learners**

- Give out the number line cards to learners. Working in pairs, they skip count forwards by 2s from 1–20. Have learners start counting from different numbers.

**High-ability learners**

- Give out 100-number charts. They count forward by 2s starting from any number up to 60.

**Assessment for Learning**

- Refer learners to exercise 1 page 18 of their Learner's Book.

**Suggested Homework**  
Write the missing numbers.

1  
20                      24                      30

2  
42                      46                      50

**Lesson 2:** Skip count backwards by 2s (60–1)

**Starter**  
Play skip counting by 2s, count forwards, by naming every other number up to 20 (2, 4, 6, 8, 10, 12...20).

**Find Out**  
Refer to page 16, count backwards by 2s from 20 – 1 starting from any number.

**Let Us Learn**

- Give out 100 number charts to learners; let them work in groups and in pairs.

### 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.



## 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.

## 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.

## 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.

Learner's Book page 49

Workbook page 25

Sub-Strand

Number: Counting, Representation, Cardinality & Ordinality

Module 10: Partitioning of whole numbers

### Content Standard

B2.1.1.1: Count and estimate quantities from 0 to 1000.

### Indicator

B2.1.1.1.4: Demonstrate a conceptual understanding of place value of whole numbers between 0 and 100

### Learning Expectation

Learners will be able to partition 2-digit numbers into different equivalent expressions.

### Essentials for Learning

Learners can determine the place value and value of a number in 3-digit numbers.

### New words

Tens, Hundreds, ones, decompose, equivalent, partition.

### Resources

100 number chart, addition, frame, mats, straws.

Number of Lessons 2

## Lesson 1: Partitioning of 2-digit numbers

### Starter

Say the rhyme "Can you count?" With the whole class.

### Find Out

Refer learners to page 49 Elicit from learners how they can decompose 54. Write this number on the board. Decompose with learners in different ways. E.g.  $38 = 3 \text{ tens}$   
 $8 \text{ ones} = 30 + 8 = 20 + 10 + 8$ . To partition a 2-digit number, we split the number into tens and ones. Get different answers from learners. (Critical thinking, collaborative learning, attention to precision)

### Let us Learn

- Put learners into groups of five. Write a number on the board for them to decompose into at least 3 different and equivalent ways. 1)  $45 \rightarrow 20 + 20 + 5$  or  $40 + 5$  or  $10 + 10 + 10 + 5$ . 2)  $68 \rightarrow 30 + 30 + 5$  or  $60 + 8$  or  $20 + 20 + 20 + 8$ .
- Refer learners to page 49 of their Learner's Book. Let them decompose the numbers in their groups.

### Review Exercise

#### Differentiated Lessons

##### Low Ability Learners

- Have learners work in pairs. They decompose these numbers into 2 different and equivalent ways: 1) 39 2) 14

### High Ability Learners

- Learners work in pairs, and decompose these numbers into 3 different equivalent ways: 1) 76 2) 85

### Assessment for Learning

Refer learners to page 51 of the Learner's Book for exercises.

### Suggested Home Work

Decompose these numbers in 3 different ways:  
1) 32 2) 69 3) 245

## Lesson 2: Partitioning of 3-digit numbers

### Starter

Play "Making 10s". Mention a number and have learners say a number which can add up to 10. E.g.

- 1)  $3 \rightarrow 7$  2)  $5 \rightarrow 5$   
3)  $2 \rightarrow 8$  4)  $7 \rightarrow 3$

### Let Us Learn

- Write 258 on the board. Ask learners to put it in the place value frame.

Hundred	Tens	Ones
2	5	8

- Working in groups of five, learners partition. 258 as 2 hundreds, 5 tens 8 ones =  $200 + 50 + 8$  or  $200 + 58$ . (Collaborative learning, critical thinking)

19

Number

## 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.

## 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.

## 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

**B2.1.2.4:** Develop and use conventional and personal strategies for computing additions up to 100

### Indicator

**B2.1.2.4.2:** Use personal strategies to add and subtract within 100

### Learning Expectation

Learners will be able to do subtraction using the compensation strategy.

### Essentials for Learning

Learners can use the compensation strategy to solve addition sentences.

### New Words

Compensate, add, constant, difference, friendly, jumps, subtract.

### Resources

Straws, bottle caps, number line cards.

Number of Lessons **3**

### Lesson 1: Subtraction (using compensation)

#### Starter

Play "1 less than". Say a number and learners subtract 1 from it, e.g.

1)  $16 \rightarrow 15$  2)  $10 \rightarrow 9$  3)  $7 \rightarrow 6$  4)  $50 \rightarrow 49$

#### Find Out

Refer learners to page 134. Elicit from learners how they will solve the subtraction problem in the picture.

How many chocolates are there? How many have been eaten? Deduce from learners how they will write a subtraction sentence for the problem. Expected answer:  $9 - 2 = 7$ . There will be different ways of solving this subtraction question. Accept them.

#### Let Us Learn

- Put learners into groups of five. Write a subtraction sentence on the board.
- Demonstrate by explaining how the subtraction sentence could be solved easily.  $53 - 19$ . Add 1 to 19 to make 20. Now the subtraction sentence becomes
- $53 - 20$ . This is easier to subtract and gives the answer as 33. The answer has to be adjusted because we subtracted 1 more than we should have done. So we have to add the 1 to that answer so,  $53 - 19 = 33 + 1 = 34$ .
- Have learners practise more in their groups and in pairs to solve the following problems.

Have them compare their answers and talk about how they solved them.

1)  $25 - 19 = ?$

2)  $46 - 29 = ?$

3)  $67 - 38 = ?$

(Critical thinking, collaborative learning, problem solving skills)

- Write  $60 - 41 = ?$  for learners to solve on the board. They should work in their groups. Explain that we shall subtract 1 from 41 to get 40. Our subtraction sentence now becomes  $60 - 40 = 20$ , which is very easy to subtract. We subtracted 1 less than we should have done (instead of subtract 41, we subtracted 40). So, we have to subtract 1 from the answer  $20 - 1 = 19$ . Give more examples for learners to solve.

1)  $70 - 41 = ?$

2)  $66 - 32 = ?$

(Critical thinking, collaborative learning, problem solving skills)

- Refer to the Learner's Book page 134. Go through the question  $95 - 57 = ?$  with learners. Use both methods by adding and subtracting.

#### Review Exercise

#### Differentiated Lessons

##### Low Ability Learners

- Have learners work in pairs to solve these.

1)  $35 - 19 = ?$

2)  $32 - 18 = ?$

## Answers

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

### ANSWERS

### Learner's Book

#### Strand 1: Number

**Sub Strand 1:** Number: Counting, representation, cardinality and ordinality

#### Module 1: Number names

##### Exercise 1 page 14

- 11 Eleven
- 13 Thirteen
- 16 Sixteen
- 19 Nineteen

##### Exercise 2 page 15

- Eighty five
- Forty nine
- Sixty nine
- Ninety six
- One hundred

#### Exercise 3

746 – Seven hundred and forty six  
164 – One hundred and sixty four  
823 – Eight hundred and twenty three  
291 – Two hundred and ninety one  
912 – Nine hundred and twelve

#### Module 2: Counting sequence

##### Exercise 1 page 18

- 6 8 12 10
- 2 6 8 10
- 14 16 20 22

4. 220 210 200 195

5. 140 135 125 120  
6. 295 280 275 270  
7. 450 445 440 430 425

##### Exercise 5 page 22

- 30 50 80
- 110 130 140
- 530 550 570
- 860 890 900
- 950 960 980 1000

##### Exercise 6 page 23

- 220 200 180
- 490 470 450
- 692 682 672 662
- 990 980 970 960
- 900 890 880 870 860

#### Module 3: Counting to find "how many".

##### Exercise 1 page 26

- a. 14  
b. 28  
c. 18  
d. 36
- a. 26  
b. 52  
c. 20  
d. 40

#### STRAND 1 Number

**Sub Strand 1:** Number: Counting, Representation, cardinality and ordinality

#### Module 1: Number names

##### Trial 1 page 2

- 12 → Twelve
- 18 → Eighteen
- 17 → Seventeen
- 15 → Fifteen

##### Trial 2 page 3

- 38
- 57
- 90
- 29
- 99

##### Trial 3 page 4

- Seven hundred and eighty
- Four hundred and ninety nine
- Nine hundred and seventy five
- One hundred and fifty six
- One thousand
- 676
- 485
- 227

#### Module 2 Counting sequence

##### Trial 1 page 5

- 26 28 32 34 38 40
- 42 44 48 50 54 56 58
- 60 64 66 70 72 76 78

### Workbook

### ANSWERS

#### Trial 5 page 7

- a. 660 670 680 690 700 710  
720 730 740  
b. 920 930 940 950 960 970  
980 990
- a. 990 980 970 960 950 940  
930 920 910  
b. 900 880 870 860 850 830  
820 810

#### Module 3: Counting to find "how many"

##### Trial 1 page 8

Count by 2s.

- 2 4 6 8 10  
12 14 16 18 20  
22 24 26 28 30  
32 34 36 38 40  
42 44 46 48 50

##### Trial 2 page 9

- Count the eggs by 5s.  
How many eggs are there? 60
- Count the bananas by 5s.  
How many bananas are there? 60

#### Trial 3 page 10

- 60
- 50
- 50
- 30
- 120



## 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 1

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 Basic 1.

#### REVISION EXERCISES - From Basic 1

- 25 Tick (✓) objects that are divided into halves. Cross out (X) objects that are not.



- 26 Draw a line to divide each item into 2 equal parts. Colour one-half of the fruit blue.



- Which holds more liquid? Write the letter.

27



- Which holds less liquid? Write the letter.

28



5

#### REVISION EXERCISES - From Basic 1

- 4 Describe the positions of the circled numbers.

5	25	45
15	10	20
40	35	50

- 5 Write 4 numbers that come **before** and **after** 28.

- a Before 28: \_\_\_\_\_ and \_\_\_\_\_  
b After 28: \_\_\_\_\_ and \_\_\_\_\_

Which two groups are the same? Tick (✓) them.



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:  
Data

4



Strand:  
Number

1



### Header and footer labels

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

**Indicator:** This feature specifies the indicator that the lessons were developed from.

**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.

B2.I.I.I.I

Sub-Strand

NUMBER: COUNTING, REPRESENTATION, CARDINALITY AND ORDINALITY

Module | Number names

8

Number

**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**

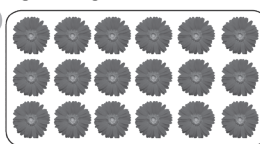
*Recommended time: 10 minutes.*

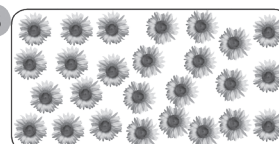
This begins every module. It teases learners knowledge on the 'big idea' of the lessons. This feature is intended to act as a foundation for discussion and investigation and is aimed at getting the learners engaged in the lesson. It brings out the **critical thinking** abilities of the learners.

**Find out**

How many?

Can you say the number name?

**A**

**B**

**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****Number names (0 to 20)**

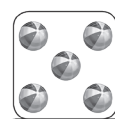
Count, then read and write the number names.

The numbers can be written in words.

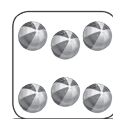
The 2 is written in words as **two**. That is the number name for 2.

1 ----- One

9 ----- Nine



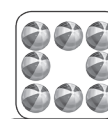
Five



Six





Seven



Eight

**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 groups of four**

Select a number from the number chart.

Each learner in the group describes the position of the selected number in relation to other numbers.

35	59	63	17	46
11	82	39	25	64
90	8	28	44	73
52	37	19	68	96



**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.

**Exercise 1**

Use place value to describe these pairs of numbers.

**Example:** 32 and 35     32 is a little less than 35.

- 1 63 and 61 \_\_\_\_\_
- 2 49 and 94 \_\_\_\_\_
- 3 52 and 55 \_\_\_\_\_
- 4 333 and 335 \_\_\_\_\_
- 5 234 and 865 \_\_\_\_\_

**Exercise 2**

Complete the following.

**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 Match the numbers to the number names.

9

60

15

30

fifteen

thirty

nine

sixty

Complete the counting sequences.

2

12

14

3

60

54

4

20

25

5

45

50

6

100

80

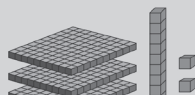
7

70

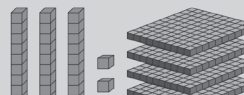
80

Write the numeral for each quantity.

8



9

**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
write number names up to one thousand.			
skip count forwards and backwards by 2s, 5s and 10s.			
count by 2s, 5s and 10s to find how many.			
represent quantities with numerals up to 1000.			
estimate quantities.			
describe position of numbers.			
use non standard units to count to find how long and how much.			

1

Strand:

**Number**

## Module 1: Number names

**Content Standard**

**B2.1.1.1:** Count and estimate quantities from 0 to 1000.

**Indicator**

**B2.1.1.1.1:** Use number names, counting sequences and how to count to find out "how many?"

**Learning Expectation**

Learners will be able to: count, read and write number names (One – Twenty).

**Essentials for Learning**

Learners can read and write numerals from 0 to 100.

**New words**

Number, twenty, number name.

**Resources**

Numeral cards 0-20, number-name cards one to twenty, straws, bottle caps, bundles of tens, multibase block.

Number of Lessons **3**

## Lesson 1: Number names (one to twenty)

**Starter**

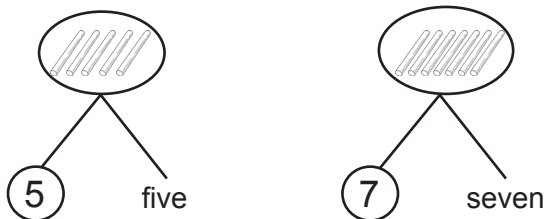
Learners count 1–20 forwards and backwards.

**Find Out**

Refer learners to page 10 of the Learner's Book. Learners count and write the number of objects in A which is 18 and the number of objects in B, which is 26.

**Let us Learn**

- Learners work in pairs, one person counts forward, number names from 1–20 and the other person counts backwards from 20–1.
- Mention a number, e.g. five. Learners in pairs count 5 straws, pick a numeral card and a number name card to match the straws.



- Repeat this activity with different number names, until you match up to the number 20. (**Critical thinking, collaborative learning**)
- Refer learners to **Let us learn: 1** on pages 10 and 11 of the Learner's Book. Learners count, read and write the number names. Have learners work in groups of four. They rotate the reading and the counting one after the other.

**Review Exercise****Differentiated Lessons****Low-ability Learners**

- Learners write number names from one to five.

**High-ability Learners**

- Learners write the number names from ten to twenty.

**Assessment for Learning**

Refer learners to Exercise 1 on page 14 of the Learner's Book.

**Suggested Homework**

Write the number names for these numbers:

- |             |             |
|-------------|-------------|
| 1) 8 _____  | 2) 12 _____ |
| 3) 20 _____ | 4) 18 _____ |

## Lesson 2: Number Name (twenty to one hundred)

**Starter**

Learners count 1 to 20 forward and backwards whiles clapping their hands simultaneously.

**Let us Learn**

- Give out 100 straws to each group. Have learners count 10 straws and bundle them. They count by tens: ten, twenty, thirty up to one hundred. Have learners count straws to represent these numbers and match number-names cards to the group of objects made.

25  → twenty-five,

67  → sixty-seven.

- Repeat this activity for different numbers. **(Critical thinking, collaborative learning)**
- Refer learners to **Let us learn: 2** on page 12 of the Learner's Book. Go through the exercise with them. Have learners read the numerals and the number names.

### Review Exercise

#### Differentiated Lessons

##### Low-Ability Learners

- Write the number names for multiples of ten up to fifty

##### High-Ability Learners

- Learners write number names for these numerals. 25, 60, 85, 45 and 99.

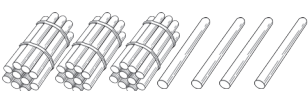
#### Assessment for Learning

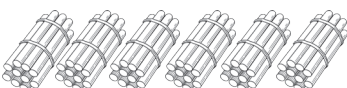
Refer learners to Exercise 2 on page 15 of the Learner's Book.

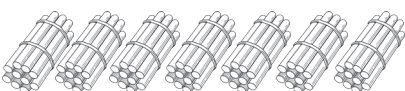
#### Suggested Home Work

Write number names for these numerals:

- 1) 32
- 2) 67
- 3) 80
- 4) 100

1) 

2) 

3) 

### Lesson 3: Number Names (one hundred to one thousand)

#### Starter

Learners count by tens from 10–100 forwards and backwards whiles clap at the same time.

#### Let us Learn

- Show 1 flat to learners as one hundred, 3 flats as three hundred, up to 1 block, which is one thousand. Learners pick any of the multibase blocks at random and mention the number name. Have learners work in groups of five. **(Critical thinking, collaborative learning)**
- Write some numerals on the board. Learners pick numeral cards and number name cards to match, e.g. 1) 500 2) 670 3) 900 4) 840. **(Critical thinking, collaborative learning)**
- Refer learners to **Let us learn: 3** on page 13 of the Learner's Book. Go through the exercise with learners. Learners read the numeral and the number names respectively.

### Review Exercise

#### Differentiated Lessons

##### Low Ability Learners

- Learners write numerals for these number names:
  1. Seven hundred \_\_\_\_\_
  2. Four hundred and twenty \_\_\_\_\_
  3. Seven hundred and ninety \_\_\_\_\_

##### High Ability Learners

- Learners write number names for these numerals: 1) 800 2) 720 3) 540

#### Assessment for Learning:

Refer learners to Exercise 3 on page 15 of the Learner's Book.

#### Suggested Homework

1. Write the number name for 250.
2. Write the number name for 700.
3. Write the numeral for eight hundred and thirty two.

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

## Module 2: Counting Sequence

**Content Standard**

**B2.1.1.1:** Count and estimate quantities from 0 to 1000.

**Indicator**

**B2.1.1.1.1:** Use number names, counting sequences and how to count to find out "how many?"

**Learning Expectation**

Learners will be able to count from 1-60.

**Essentials for Learning**

Learners can count from 1-20.

**New words**

One, two–twenty, skip count, count, tens, fives.

**Resources**

Numeral cards 0 to 20, 100 number chart, number line (0 and 20).

Number of Lessons **6**

### Lesson 1: Skip count forward by 2s (1– 60)

**Starter**

Play; "Counting forward and backwards"  
(1 – 20).

**Find Out**

Refer to Learner's Book page 16. Learners look at the boy and describe what he is doing. The boy is counting by 2s starting from 202, 204, ...

**Let us Learn**

- Put learners into groups of five. Give out number line cards to learners. They skip count by 2s from 1 – 20. Make sure every learner gets a turn to take part.
- Give out the 100-number charts to learners in pairs. They skip count forward by 2s from any number up to 60.
- Refer learners to **Let us learn: 1** on page 16 of the Learner's Book. Go through the exercise with learners.
- Have learners skip count forwards by 2s up to 60. Learners say the shaded numbers aloud.

**Review Exercise****Differentiated Lessons****Low-ability learners**

- Give out the number line cards to learners. Working in pairs, they skip count forwards by 2s from 1–20. Have learners start counting from different numbers.

**High-ability learners**

- Give out 100-number charts. They count forward by 2s starting from any number up to 60.

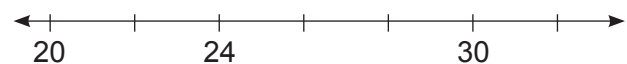
**Assessment for Learning**

- Refer learners to Exercise 1 on page 18 of the Learner's Book.

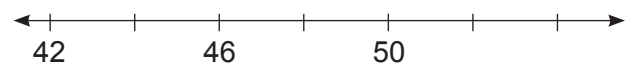
**Suggested Homework**

Write the missing numbers.

**1**



**2**



### Lesson 2: Skip count backwards by 2s (60–1)

**Starter**

Play skip counting by 2s, count forwards by naming every other number up to 20 (2, 4, 6, 8, 10, 12...20).

**Find Out**

Refer to page 16, count backwards by 2s from 20 – 1 starting from any number.

**Let Us Learn**

- Give out 100' number charts to learners; let them work in groups and in pairs.



Starting from any number, have learners count backwards from 60 to 1, moving from right to left. Have learners know that when they move from right to left, they are counting backwards. (**Critical thinking, collaborative learning, attention to precision**)

### Review Exercise

### Differentiated Lessons

#### Low Ability Learners

- Give out number line cards to learners. Working in pairs, have them count backwards, starting from 40 to 1. They can start from any number and count backwards.

#### High Ability Learners

- Give out 100-number charts to learners. Have them work in pairs. Ask them to do reverse counting from 60 to 1 as they skip from right to left. Have them start from different numbers. (**Critical learning, attention to precision**)
- Refer learners to page 17 of the Learner's Book and go through the activities with them.

### Assessment for Learning

Refer learners to Exercise 2 on page 19 of the Learner's Book.

### Suggested Homework

Skip count backwards in 2s from 40 to 20. Write the numbers.

## Lesson 3: Skip count forwards by 5s.

### Starter

Play: "Making 10s". Call out a number and ask learners to call out another number which will add to your number to make 10.

Eg. 1)  $4 \rightarrow 6$       2)  $3 \rightarrow 7$   
3)  $2 \rightarrow 8$       4)  $1 \rightarrow 9$

### Find Out

Refer to page 16. Learners say how the girl is counting and they do the same. The girl is counting forwards by 5s starting from 55. (**Critical thinking, personal development**)

### Let Us Learn

- Give learners a 100 number chart. In groups of five, have them skip count forwards by 5s starting from any number and ends on 100. They continue counting forwards up to 200.
- Refer to **Let us learn: 2**, on page 17 of the Learner's Book. Learners count forwards by 5s up to 160. Have learners continue counting up to 500.

### Review Exercise

### Differentiated Lessons

#### Low Ability Learners

- Give a 100 number chart. Working in pairs, count by 5s starting from any number up to 100.

#### High Ability Learners

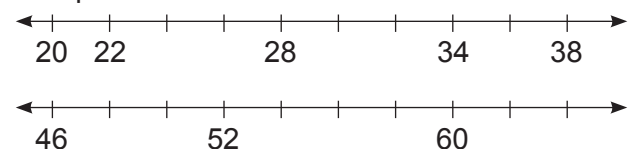
- Give learners a 200 number chart. They count forward by 5s starting from any number up to 200. They should continue up to 500.

### Assessment for Learning

Refer learners to Exercise 3 on page 20 of the Learner's Book.

### Suggested Homework

Complete the number line.



## Lesson 4: Skip count backwards by 5s (500–100)

### Starter

Play "Making 5s". Mention a number and learners say another number which when added to the number mentioned, gives 5.

E.g. 1)  $1 \rightarrow 4$       2)  $3 \rightarrow 2$   
3)  $2 \rightarrow 3$       4)  $5 \rightarrow 0$

### Find Out

Refer learners to page 16 of Learner's Book. They describe what the girl is doing. She is counting backwards by 5s from 80.



**Let Us Learn**

- Give learners a 100 number chart. Working in groups of five, learners reverse counting by 5s starting from any number.
- Refer to **Let us learn: 2**, on page 17 of the Learner's Book. Have Learners count backwards by 5s starting from any number.

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

- Give out a 100 number chart to learners. Working in pairs, they skip count backwards by 5s starting from any number up to 1.

**High Ability Learners**

- Give out a 200 number charts to learners. Working in pairs, learners count backwards by 5s starting from different numbers.

**Assessment for Learning**

Refer learners to Exercise 4 on page 21 of the Learner's Book.

**Suggested Homework**

1. Write multiples of 5, starting from 200 up to 100.

**Lesson 5: Skip count forwards by 10s (100 – 1000)****Starter**

Play; "Making 10s". Mention a number and ask learners to state a number that will add up to

10. Eg. 1)  $7 \rightarrow 3$                       2)  $2 \rightarrow 8$   
           3)  $6 \rightarrow 4$                       4)  $1 \rightarrow 9$

**Find Out**

Refer to page 16 of the learners book.

Learners find out how the boy is counting. He is counting by 10s from 100.

**Let Us Learn**

- Give out 160 number charts to learners. Working in groups of five, they count forwards by 10s starting from any number. Make sure everybody takes part.
- Refer to the **Let us learn: 2**, on page 17 of the Learner's Book. Give out the

160-number charts to learners. Working in pairs, they skip count forwards by 10s up to 160. Have learners continue counting up to 1000.

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

- Give out the 100-number charts to learners. In pairs, they skip count forward by 10s, starting on any number up to 200.

**High Ability Learners**

- Learners working in pairs, skip count forward by 10s. Starting on different numbers from the 160-number charts, they continue counting by 10s up to 500.

**Assessment for Learning:**

Refer learners to Exercise 5 on page 22 of their Learner's Book.

**Suggested Homework**

1. Write multiples of 10, starting from 3 up to 100.

**Lesson 6: Skip count backwards by 10s (1000 – 100)****Starter:**

Play "Making 10s. Mention a number and ask learners to call out a number which will add up to 10.

- Eg. 1)  $1 \rightarrow 9$                       2)  $3 \rightarrow 7$   
       3)  $4 \rightarrow 6$                       4)  $2 \rightarrow 8$

**Find Out**

Refer learners to page 16 of the Learners' Book. Have learners count backwards by 10s using the reverse of **Let us learn: 3**.

**Let Us Learn**

- Give out the 100-number charts to learners. Let them count backwards in 10s from any number. Have them work in groups and in pairs. (**Critical thinking collaborative learning, personal development**)
- Refer learners to **Let us learn: 3** on page 17 of their Learners Book. Let them work in pairs and count backwards by 10s starting from 160 down to 101.

Adding the same number over and over again is skip counting forwards.

Subtracting the same number over and over again is skip counting backwards.

### Review Exercise

#### Differentiated Lessons

##### Low Ability Learners

- Working in pairs learners count backwards by 10s, starting from any number.

##### High Ability Learners

- Learners skip count backwards by 10s from 500 – 100.

##### Assessment for Learning:

Refer learners to Exercise 6 on page 23 of the Learner's Book.

##### Suggested Homework

1. Write multiples of 10, starting from 10 up to 100.

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

**Module 3:** Counting to find “how many”**Content Standard**

**B2.1.1.1:** Count and estimate quantities from 0 to 1000

**Indicator**

**B2.1.1.1.1:** Use number names, counting sequences and how to count to find out “how many?”

**Learning Expectation**

Learners will be able to count by 2s to find “how many”.

**Essentials For Learning**

Learners can count forwards by 1s from 1 to 100.

**New Words**

number, twos, skip count

**Resources**

Number line cards, 100 number chart, straws, bottle caps, number cards 1–20.

Number of Lessons **3**

**Lesson 1:** Counting by 2s to find “how many”**Starter**

Clap and count forwards from 1 to 20.

**Find Out**

Refer to **Find out**, on page 24 of the Learner's Book. Learners look at the banana. They count by 2s to get the total. 2, 4, 6, 8, 10. Have learners work in pairs.

**Let Us Learn**

- Learners work in groups of five. Give out 20 straws to each group. They arrange them on their tables and count them by 2s, E.g. 2, 4, 6, 8, 10, 12, 14, 16, 18, 20 (**Collaborative learning**)
- Have learners tell you the number of legs of a hen. Have learners tell you the total number of legs of 6 hens. Call out 7 learners to the front of the class. Each one should join their hands and stretch them forward. The class count 2, 4, 6, 8, 10, 12, 14. Learners tell the total number of hands shown (**Collaborative learning, personal development**)
- Refer to **Let us learn: 1** on page 24 of the Learner's Book. Learners say the total number of items as they skip count by 2s, i.e. A - 14, B - 18.

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

- Learners work in pairs. Give them 20 bottle caps. They group them in 2s and count by 2s to find out, how many.

**High Ability Learners**

- Give 60 bottle caps to learners. Working in pairs, learners pair the bottle tops and count by 2s to find out how many.

**Assessment For Learning**

Refer learners to page 26 of the Learner's Book for exercise.

**Suggested Home Work**

- Say and write multiples of 2s starting from 2 up to 60.

**Lesson 2:** Counting by 5s to find “how many”**Starter**

Have learners clap and count forwards simultaneously, by 2s, from 2 up to 20.

**Let Us Learn**

- Group 20 books by 5s on a table. Pick 1 group and learners count it as 5. Keep on adding groups of 5 books while learners count: 5, 10, 15, 20.

- In their groups, learners take 20 straws and group them into 5s. They count together and tell the total number of straws. (**Critical thinking, Collaborative learning**)
- Have learners group themselves by 5s outside the classroom. After that, they count by fives to know the total number of learners in the class.
- Refer to **Let us learn: 2** on page 25 of the Learner's Book. Have learners count by 5s to know the total number of circles and rabbits.

### Review Exercise

### Differentiated Lessons

#### Low Ability Learners

- Have learners work in pairs. Give them 50 straws. They group them in 5s and count by fives to find out how many.

#### High Ability Learners

- Give 100 bottle caps to learners. Working in groups, learners group the bottle caps in 5s and count by 5s to find out how many.

### Assessment For Learning

Refer learners to page 27 of the Learner's Book for exercise.

### Suggested Home Work

1. Have learners collect small stones. They should group them in 5s. Ask them to count the number of groups they have and write it down. They then count by 5s to find out how many stones they collected.

## Lesson 3: Counting by 10s to find "how many"

### Starter

Learners count forwards and backwards from 1 to 20 and clap simultaneously.

### Let Us Learn

- Call a girl and a boy to the front of the class. They put their fingers together and show them to the class. Have learners count the group of fingers (by 10s) and say the total number, i.e. 20.
- Call 8 more learners to join them. They all hold up their fingers. The class count by 10s to find out the total number of fingers of the 10 learners: i.e. 10, 20, 30, 40, 50, 60, 70, 80, 100.
- Group learners into fives and give them 100 straws. They count by 10s and bundle them. They display them on the table and count by 10s to tell the total number of straws: 10, 20, 30, 40, 50...100. (**Critical thinking, collaborative learning**)
- Refer learners to **Let us learn: 3** on page 25 of the Learner's Book. Learners count the number of circles and bundles of sticks and write the total number.

### Review Exercise

### Differentiated Lessons

#### Low Ability Learners

- Have learners work in pairs. Give them 100 sticks. They group and count by 10s to find out how many.

#### High Ability Learners

- Give learners 200 bottle caps. Learners working in groups, count by 10s to find out how many.

### Assessment for Learning

Refer learners to page 28 of the Learner's Book for exercise.

### Suggested Home Work

1. Count and write in 10s from 55 to 105.
2. Count and write in 10s from 800 up to 1000.

For additional exercises on this module, refer to pages 8 - 10 of the Workbook.

**Module 4:** Representing quantities with numerals**Content Standard**

**B2.1.1.1:** Count and estimate quantities from 0 to 1000.

**Indicator**

**B2.1.1.1.1:** Use number names, counting sequences and how to count to find out “how many?”

**Learning Expectation:**

Learners will be able to: represent quantity of objects with numerals.

**Essentials for Learning:**

Learners can count forward/backwards by 5s and 10s up to 100.

**New words:**

hundred, thousand, number.

**Resources:** Numeral cards 100–1000, straws, 100 number chart, 1000 number chart.

Number of Lessons **2**

### Lesson 1: Representing quantities of objects with numerals (1–100)

**Starter:**

Play “Making 5s”. Mention a number and learners add another number that adds up to five, e.g. 1)  $1 \rightarrow 4$     2)  $3 \rightarrow 2$     3)  $0 \rightarrow 5$

**Find Out**

Refer to page 29 of the Learner's Book. Have learners look at the multibase blocks and interpret the quantities for each one. (**Critical thinking**)

**Let us Learn**

- Give out straws to learners in their various groups. Learners count by 10s and tie them till they get ten groups of 10, which makes 100.
- Learners tie the ten 10s together as 100.
- Give at least, 100 bottle caps to each group. Mention a number e.g. 25. Have them count and pick a numeral card to represent it. (**Problem solving skills, critical thinking, collaborative learning**)
- Refer to the Learner's Book page 29. Go through, **Let us learn: 1** with learners.

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

- Have learners work in pairs. Ask them to count straws for these numbers and match them with the correct numerals.  
1) 23    2) 19

**High Ability Learners**

- Have learners work in pairs. One mentions a number between 10 and 100 and the other learner picks a number card to represent it. (**Critical thinking, collaborative learning**).

**Assessment for Learning**

Refer learners to page 31 of the Learner's Book for exercise.

**Suggested Homework**

Use straws to make groups of objects with these numerals:

1. 8    2. 15    3. 25    4. 96

## Lesson 2: Representing quantities of objects with numerals (100 – 1000)

### Starter

Play “Counting forward by 10s up to 100: 10, 20, 30.....100.

### Find Out

Refer to the Learner’s Book, page 29. Learners recap “how many”.

### Let Us Learn

- Mention a number randomly between 0 to 100. Learners quickly pick a numeral card to represent that number.
- Refer to **Let us learn: 2** on page 30 of the Learner’s Book. Learners count the multibase block up to 1000.
- Working in groups of five, a learner mentions a number randomly from 100 to 1000. The other learners write the numeral for it on a sheet of paper and show it to their friends in the group. (*Collaborative learning, critical thinking*).

### Review

#### Differentiated Lessons

##### Low Ability Learners

- Give them numeral cards 100–500. Working in pairs, one learner mentions a number and the other one picks a numeral card to represent it.

##### High Ability Learners

- Working in groups of four, provide numeral cards from 100 – 1000 to learners. One learner mentions a number between 100 – 1000 and another learner writes it on a sheet of paper. Learners should take turns.
- A learner mentions a number between 500 – 1000 and another learner goes through the numeral cards and picks the correct one to represent it.
- Again, a learner picks a number card and the group mentions the number name.

#### Assessment for Learning

Refer learners to Exercise 2 on page 32 of the Learner’s Book.

#### Suggested Homework

1. Write multiples of 100 up to 1000.

For additional exercises on this module, refer to pages 11 - 12 of the Workbook.



## Module 5: Estimating quantities

**Content Standard**

**B2.1.1.1:** Count and estimate quantities from 0 to 1000

**Indicator**

**B2.1.1.1.1:** Use number names, counting sequences and how to count to find out "how many?"

**Learning Expectation**

Learners will be able to: estimate objects in a group and count to find "how many"

**Essentials for Learning**

Learners can count objects in a group and write the numeral for it.

**New words**

Estimate, guess, actual

**Resources**

Straws, bottle caps, pencils, marbles, seeds, containers.

Number of Lessons **1****Lesson 1:** Finding estimates.**Starter**

Play "Making Double". Mention a number and learners double that number. Examples:

- |          |            |
|----------|------------|
| 1) 3 → 6 | 2) 5 → 10  |
| 3) 2 → 4 | 4) 10 → 20 |

**Find Out:**

Refer learners to page 33 of the Learner's Book. They guess the number of balls on the page and later count to get the actual number. *(Critical thinking, justification of ideas)*

**Let us Learn**

- Put a number of marbles and bottle caps in containers. In their groups, learners guess the number first and later count to get the actual number.
- Give out straws and marbles to each group. A learner picks some of them and the rest guess the number. They count the marbles and straws to get the actual number. *(Critical thinking, justification of ideas, collaborative learning)*
- Refer to **Let us learn: 1a** and **1b**, on pages 33 and 34 of the Learner's Book. Go through the activities with learners. Have them guess the numbers before counting them.

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

- Give out 30 bottle caps to learners. Working in pairs, one of the two puts some caps in a container for the other to guess the number inside. Have them count to find the actual number.

**High Ability Learners**

- Give out 80 seeds to each group. Working in groups, a leader puts some of the seeds in a container. The others guess the number. They finally count to get the actual number. The one who makes a good estimate wins.

**Assessment for Learning**

Refer learners to page 35 of the Learner's Book for exercise.

**Suggested Homework**

Learners estimate the number of doors and windows in their homes, count and write the actual number. They compare their findings and discuss with the members in their groups the next day.

For additional exercises on this module, refer to pages 13 - 14 of the Workbook.

**Module 6:** Describing the position of numbers**Content Standard**

**B2.1.1.1:** Count and estimate quantities from 0 to 1000.

**Indicator**

**B2.1.1.1.2:** Identify numbers in different positions around a given number in a number chart, (1 to 1000).

**Learning Expectation**

Learners will be able to describe the position of a given number in different ways.

**Essentials for Learning**

Learners can identify and write numerals from 1 to 100. They can skip count forward by 10s, starting from 10 up to 100 and backwards from 100 down to 10.

**New words**

Position, above, below, left, right.

**Resources**

100 number charts, 1000 number charts, numeral cards (1-20)

Number of Lessons **1****Lesson 1:** Describing the position of numbers**Starter**

Play "1 more than and 1 less than". Mention a number and learners say the number which is 1 less and 1 more than the number mentioned. E.g. 23: 22 is 1 less than 23 and 24 is one more than 23.

**Find Out**

Refer to page 36 of Learner's Book. Learners answer the question. Who am I? Have different learners describe the position of the number 45 in different ways.

**Let us Learn**

- Point to a learner in the class. The rest describe the position where the learner pointed at is sitting in relation to other learners. Examples:  
Kwame is sitting to the left of Mawusi.  
Afia is sitting at the right of Mawusi.  
Dede is sitting in front of Mawusi.  
Fati is sitting behind Mawusi. (**Critical thinking and collaborative learning**)
- Repeat this activity with different learners in different positions.
- Refer to **Let us learn** on page 36 of the Learner's Book. Go through the questions with learners. They should describe the number 32 in different ways.

- Give out number charts like the one on page 37 to each group. One selects a number and the rest describes its position. (**Critical thinking and collaborative learning**)

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

- Have learners sit in sizeable groups. Give each group a 50 numeral chart. The leader selects a number from the chart and the rest describes the position of that number.

**High Ability Learners**

- Hand out 1000 number charts. In their various groups, they select a leader, who circles a number. The rest describes the position of the circled number in 5 different ways. (**Leadership skills, critical thinking and collaborative learning**)

**Assessment for Learning**

Refer learners to page 38 of the Learner's Book for exercise.

**Suggested Homework**

Use your 100 number chart. Describe the position of 63 in 4 different ways.

For additional exercises on this module, refer to pages 15 - 17 of the Workbook.



**Module 7:** Using non-standard units for measuring (1)**Content Standard**

**B2.1.1.1:** Count and estimate quantities from 0 to 1000.

**Indicator**

**B2.1.1.1.3** Use number names and non-standard units (marked 10s and 1s) for measuring (lengths and volumes) to count to find out "How long or how much?" up to 999.

**Learning Expectation**

Learners will be able to use objects to measure and count, to find "how many".

**Essentials for Learning**

Learners can use their hand span to measure their tables, and find how many hands spans they have used.

**New words**

Length, foot length, arm span, hand span, stride.

**Resources**

Calibrated sticks, straws, pencils, crayons, paper clips.

Number of Lessons **2**

**Lesson 1:** Counting to find "how long" (using objects)**Starter**

Sing the song "I'm counting one".

**Find Out**

Refer learners to page 39 of the Learner's Book. They should count the number of beads in the picture to find the answer.

**Let us Learn**

- Put the class into four groups.
  - Group 1:** Uses straws to measure the length of the board.
  - Group 2:** Uses crayons to measure the length of the teacher's table.
  - Group 3:** Uses paper clips to measure the length of their tables.
  - Group 4:** Uses sticks to measure the length of the veranda in front of their classroom.
- Each group tells how many times they used the objects to measure the item. *(Critical thinking, collaborative learning, attention to precision).*
- Give each group a stick marked in 10s to measure the following lengths.
  - Group 1:** The length of the veranda.
  - Group 2:** The height of the cupboard.
  - Group 3:** The height of the teacher's table.
  - Group 4:** The length of the school veranda from one end to the other end. *(collaborative learning, leadership skills, attention to precision)*

- Refer to **Let us learn** on page 39 of the Learner's Book. Have learners find the number of interlocking cubes and the number of straws used to measure the ribbon.

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

- Give out paper clips to each learner. Working in pairs, have learners measure the length and width of their exercise books.

**High Ability Learners:**

- Give out sticks marked in 10s to learners in their groups. They measure the length and width of the school compound. They tell the class the number of times they used the stick to measure. *(Collaborative learning, critical thinking).*

**Assessment for Learning**

Refer learners to page 41 of the Learner's Book for exercise.

**Suggested Homework**

- Learners use any object to measure the length of their door and their dining table.
- Learners compare their answers in their groups and talk about them.

## Lesson 2: Counting to find “how long” using (using body parts)

### Starter

Sing “I’m counting one” with learners.

### Find Out

Refer to the Learner’s Book page 39 Learners recap.

### Let Us Learn

- In groups of five, learners do these activities:
  - Group 1:** Use a hand span to measure the length of the teacher’s Table.
  - Group 2:** Use an arm span to measure the length of classroom wall.
  - Group 3:** Use half arm span to measure the width of the classroom wall.
  - Group 4:** Use a stride to measure the width of the football field.
- Learners come back to record the number of times they used the body part to measure their item. They talk about the differences in their answers. (**Critical thinking, collaborative learning, attention to precision**)

### Review Exercise

#### Differentiated Lessons

##### Low Ability Learners

- Working in pairs, learners use their pointing finger to measure the lengths and widths of their Maths Learner’s Book.

##### High Ability Learners

- In groups of four, each learner uses his/her stride to measure the lengths and width of the school block.
- They count to find the differences in the number and justify why the differences. Example: (Some learners are tall and their strides are longer whereas shorter learners have shorter strides). (**Critical thinking, collaborative learning, justification of ideas**).

#### Assessment for Learning

Refer learners to Exercise 2 on page 42 of their Learner’s Book.

#### Suggested Homework

- Learners use their forefinger to measure the length of their door. They write the number down.
- Learners discuss their findings in their groups the next day and justify the differences.

For additional exercises on this module, refer to pages 18 - 20 of the Workbook.

**Module 8:** Using non-standard units for measuring (2)**Content Standard**

**B2.1.1.1:** Count and estimate quantities from 0 to 1000.

**Indicator**

**B2.1.1.1.3** Use number names and non-standard units (marked 10s and 1s) for measuring (lengths and volumes) to count to find out "How long or how much?" up to 999.

**Learning Expectation**

Learners will be able to: use non-standard units to measure volumes and count to find out "how much?".

**Essentials for Learning**

Learners can use body parts to measure the length of objects.

**New words**

Capacity, measure.

**Resources**

Empty containers of different sizes, cups, empty bottles, sand, water.

Number of Lessons **1****Lesson 1:** Counting to find "how much?"**Starter**

Learners sing the song "A circle is a shape".

**Find Out**

Refer learners to page 43 of the Learner's Book. Learners guess how many spade full of sand will fill the bucket. They should justify their answers. (**Critical thinking, collaborative learning, justification of ideas**)

**Let us Learn**

- Put learners into groups of four. Give them two different sizes of containers. They fill the bigger container with water using the smaller one and state the number of times the smaller container filled the bigger one.
  - Group 1:** Milo tin and a bucket.
  - Group 2:** 500ml bottle and a bucket.
  - Group 3:** Milk tin and a litre bottle.
  - Group 4:** Small tomatoes tin and a Milo tin.
  - Group 5:** A tablespoon and a small tomato tin.
- Each group records the number of times the smaller container was used to fill the bigger one and explain the differences noticed. (**Critical thinking, collaborative learning, justification of ideas**)
- Refer learners to **Let us learn** on page 43 of the Learner's Book. Learners guess the number of times the small containers can fill the big one.

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

- Give learners a teacup and a bowl. They use the teacup to fill the bowl and determine the number of cups that filled the bowl.

**High Ability Learners**

- Give out sand, a small bowl and a bucket. Learners use the bowl to fill the bucket with the sand and record the number of bowls used.

**Assessment for Learning**

Refer learners to page 44 of the Learner's Book for exercise.

**Suggested Homework**

- Learners use a cup to fill a bucket. They Record the number of cups used.
- Learners compare their results the next day. Elicit from learners why they got different answers. (**Critical thinking, collaborative learning, justification of ideas**)

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

## Module 9: Place value

## Content Standard

**B2.1.1.1:** Count and estimate quantities from 0 to 1000.

## Indicator

**B2.1.1.1.4** Demonstrate a conceptual understanding of place value of whole numbers between 0 and 100.

## Learning Expectation

Learners will be able to develop a conceptual understanding of place value of whole numbers between 0 and 1000.

## Essentials for Learning

Learners can count in 100s up to 1000.

## New words

Ones, tens, hundreds, thousands, abacus.

## Resources

Abacus, tens frame, multibase blocks, bundles of straws in tens up to 100.

Number of Lessons **2**

## Lesson 1: Place value of 2-digit numbers

## Starter

Play "Making 10s". Mention a number and learners call a number which when added to the number mentioned makes 10. E.g.

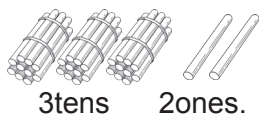
- 1)  $2 \rightarrow 8$       2)  $6 \rightarrow 4$   
3)  $1 \rightarrow 9$       4)  $5 \rightarrow 5$

## Find Out

Refer learners to page 45 of the Learner's Book. Learners identify the number at the back of the car. Have them talk about it.

## Let us Learn

- Put learners into groups of five. Give them sufficient number of straws. Write 32 on the board. Guide them to bundle 32 as 3 tens and 2 ones. They count 10 straws and tie it as 1 ten. (**Collaborative learning**)



- Learners repeat this activity until they get 9 tens and 9 ones. When 1 more is added to the ones. They get 10 tens which is 100. Learners bundle the 10 tens as 1 hundred.
- Learners use beads and abacus to model these numbers: 1) 78    2) 64 (**Critical thinking, collaborative learning, attention to precision**).

- Use the tens frame to explain these numbers:

Tens Frame

Hundred	Tens	Ones
	5	4

- Explain to learners that the value of a digit depends upon its place within a numeral.
- Refer learners to **Let us learn: 1** on page 45 of the Learner's Book. They model 54 using the abacus, beads and straws.

## Review Exercise

## Differentiated Lessons

## Low Ability Learners

- Working in pairs, learners model these numbers using straws: 1) 26    2) 33    3) 48

## High Ability Learners

- Learners use abacus to model these numbers: 1) 68    2) 86    3) 99

## Assessment for Learning

Refer learners to page 47 of the Learner's Book for exercise.

## Suggested Homework

Learners use straws to model these numbers at home and bring them to school the next day. In their groups, learners compare and check their answers.

- 1) 35                      2) 29                      3) 36

**Lesson 2:** Place value of 3-digit numbers**Starter**

Play "Making 10s". Call out a number and have learners call out another number that adds up to make 10. E.g.

- 1)  $3 \rightarrow 7$       2)  $6 \rightarrow 4$   
3)  $8 \rightarrow 2$       4)  $1 \rightarrow 9$

**Let Us Learn**

- Write 265 on the board. Have learners decompose it. Learners should be in groups of five.  $265 \rightarrow 200 + 60 + 5$  or  $200 + 65$
- Learners use the place value frame to model it.

Hundred	Tens	Ones
2	6	5

- The place value of a number is the value of a digit in a numeral. The place value of the digit 6 in 265 is **tens** and its value is **sixty**. The position of a digit determines its value. The 5 in 265 is 5 ones.
- Refer to **Let us learn: 2** on page 46 of the Learner's Book. Take learners through the exercise 2. Learners determine the place values and the values of each digit in 154. (*Collaborative learning, critical thinking, attention to precision*)

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

- Put learners into groups of five. Let them find the place values and values of these numbers: 1) 68    2) 99

**High Ability Learners**

- Learners working in pairs, find the values and the place values of these numbers: 1) 268    2) 896

**Assessment for Learning**

Refer learners to Exercise 2 on page 48 of the Learner's Book.

**Suggested Homework**

Find the values and the place values of the underlined numbers:

- 1). 368      2). 2568      3). 102

For additional exercises on this module, refer to pages 22 - 24 of the Workbook.

**Module 10:** Partitioning of whole numbers**Content Standard**

**B2.1.1.1:** Count and estimate quantities from 0 to 1000.

**Indicator**

**B2.1.1.1.4:** Demonstrate a conceptual understanding of place value of whole numbers between 0 and 100.

**Learning Expectation**

Learners will be able to partition 2-digit numbers into different equivalent expressions.

**Essentials for Learning**

Learners can determine the place value and value of a number in 3-digit numbers.

**New words**

Tens, Hundreds, ones, decompose, equivalent, partition.

**Resources**

100 number chart, addition frame, mats, straws.

Number of Lessons **2**

**Lesson 1:** Partitioning of 2-digit numbers**Starter**

Say the rhyme "Can you count?" With the whole class.

**Find Out**

Refer learners to page 49 of the Learner's Book. Elicit from learners how they can decompose 54. Write a number on the board. Decompose with learners in different ways. E.g.  $38 = 3 \text{ tens } 8 \text{ ones} = 30 + 8 = 20 + 10 + 8$ . To partition a 2-digit number, we split the number into tens and ones. Get different answers from learners. (**Critical thinking, collaborative learning, attention to precision**)

**Let us Learn**

- Put learners into groups of five. Write a number on the board for them to decompose into at least 3 different and equivalent ways. 1)  $45 \rightarrow 20 + 20 + 5$  or  $40 + 5$  or  $10 + 10 + 10 + 10 + 5$ . 2)  $68 \rightarrow 30 + 30 + 5$  or  $60 + 8$  or  $20 + 20 + 20 + 8$ .
- Refer learners to **Let us learn: 1** on page 49 of the Learner's Book. Let them decompose the numbers in their groups.

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

- Have learners work in pairs. They decompose these numbers into 2 different and equivalent ways: 1) 39 2) 14

**High Ability Learners**

- Learners work in pairs, and decompose these numbers into 3 different equivalent ways: 1) 76 2) 85

**Assessment for Learning**

Refer learners to page 51 of the Learner's Book for exercise.

**Suggested Home Work**

Decompose these numbers in 3 different ways:

1) 32 2) 69 3) 245

**Lesson 2:** Partitioning of 3-digit numbers**Starter**

Play "Making 10s". Mention a number and have learners say a number which can add up to 10. E.g.

1)  $3 \rightarrow 7$  2)  $5 \rightarrow 5$

3)  $2 \rightarrow 8$  4)  $7 \rightarrow 3$

**Find Out**

Refer learners to **Find out** on page 49 of the Learner's Book.

Elicit from learners how they can decompose 246. To partition a 3-digit number, we split the number into hundreds, tens and ones. Get different answers from learners. (**Critical thinking, collaborative learning, attention to precision**)



**Let Us Learn**

- Write 258 on the board. Ask learners to put it in the place value frame.

Hundred	Tens	Ones
2	5	8

- Working in groups of five, learners partition. 258 as 2 hundreds, 5 tens 8 ones =  $200 + 50 + 8$  or  $200 + 58$ . (**Collaborative learning, critical thinking**)
- In their various groups, have learners write their own 3 digit numbers. They use the place value frame to partition the numbers.
- Let them do group presentation to the whole class. They correct themselves if they identify any error. (**Collaborative learning, critical thinking**)
- Refer to **Let us learn: 2** on page 50 of the Learner's Book. Go through the exercise with learners. Have them work in pairs. They should select a leader. (**Leadership skills critical thinking, collaborative learning**)

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

- Have learners work in pairs to partition these numbers: 1) 89    2) 126

**High Ability Learners**

- Working in pairs, learners decompose these numbers in two different and equivalent ways:  
1) 426    2) 689    3) 999

**Assessment for Learning**

Refer learners to Exercise 2 on page 52 of the Learner's Book.

**Suggested Homework**

Partition these numbers Into 2 different and equivalent ways:

- 1) 58    2) 306    3) 700    4) 260

For additional exercises on this module, refer to pages 25 - 26 of the Workbook.

**Module 11:** Describing numbers in equivalent ways**Content Standard**

**B2.1.1.1:** Count and estimate quantities from 0 to 1000.

**Indicator**

**B2.1.1.1.5:** Represent number quantities up to 1000 in equivalent ways focusing on place value and equality.

**Learners Expectations**

Learners will be able to describe two numbers using expressions such as 'a little more', 'a lot bigger' and 'larger than'.

**Essentials For Learning**

Learners can compare 2 numbers using the symbols ">," <" and "=" to make a statement true.

**New Words**

A lot bigger than, a lot smaller than, a little smaller than, a little larger than.

**Resources**

Numeral cards (1-20), 100 number chart.

Number of Lessons **2**

**Lesson 1:** Numbers more than or less than**Starter**

Play "1 less". Mention a number and learners reduce it by 1 and say it out loud.

E.g. 1) 20 → 19    2) 54 → 53  
3) 100 → 99    4) 98 → 97

**Find out**

Refer learners to **Find out: A** on page 53 of the Learner's Book. Have them look at the ages of the two men. Let them talk about the difference between their ages:

E.g. The older man's age is more than twice the younger man's age. Elicit from learners to come out with different expressions of describing the two ages.

**Let Us Learn**

- Show a big book and a very small one to the class. They should tell you the difference between the two. "One is very big and the other is very small." Tell learners that expressions like "a lot bigger/ a lot smaller" could be used to describe the relationship between the two books.
- Write 20 and 19 on the board. Have learners use the expression "a little bigger and a little smaller" to describe the relationship. They should work in groups of five. (**critical thinking, collaborative learning, attention to precision**)

E.g. "19 is a little smaller than 20" and "20 is a little bigger than 19"

- Refer to the Learner's Book, **Let us learn: 1** on page 53. Let learners look at the numbers 36 and 78. Draw learners' attention to the tens column, i.e. 3 tens and 7 tens. 3 tens is a lot smaller than 7 tens. So, 36 is **a lot less** than 78 and 78 is **a lot bigger** than 36. Have learners write their own numbers and describe them, using these expressions. They should justify what they say. (**Justification of ideas, Critical thinking, collaborative learning**)

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

- Use the expressions a little/lot bigger/smaller than to describe these pairs of numbers:  
1) 15 and 17    2) 52 and 21

**High Ability Learners**

- Describe these numbers using the expressions learnt.  
(1) 85 and 32    (2) 33 and 30  
(3) 46 and 14.

**Assessment For Learning**

Refer learners to Exercise 1 on page 55 of their Learner's Book.

**Suggested Home Work**

Describe the relationship between the pairs of numbers:

- 1) 6 and 9    2) 39 and 26    3) 72 and 99  
4) 55 and 60

**Lesson 2:** Describing numbers in equivalent ways

Starter: Play “1 more than”. Mention a number and learners add 1 to it and say it out loud.

E.g. 1) 16 → 17    2) 29 → 30  
3) 89 → 90    4) 99 → 100

**Find Out**

Refer learners to **Find out: B** on page 53 of the Learner’s. They look at the two cylinders. They should look at the different weights and use the expressions “a lot bigger/a lot larger/a little larger than” to describe the two cylinders. Learners should justify their answers.

*(Critical thinking, collaborative learning, justification of ideas)*

**Let us Learn**

- Write 85 on the board. In groups of five, learners describe the number in 4 different and equivalent ways. E.g.
  - 85 is 5 less than 90.
  - 85 is half of 170.
  - 85 comes before 86 and after 84.
  - 85 is 3 less than 88 *(Critical thinking, collaborative learning)*
- Now, have learners work in groups. They describe 260 in 4 different but equivalent ways. *(critical thinking, collaborative learning, justification of ideas)*

- Refer learners to **Let us learn: 2** on page 54 of the Learner’s Book. Let them describe the number 62 in as many ways as possible.

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

- Work in pairs. Describe 65 in 3 different and equivalent ways.

**High Ability Learners**

- Work in pairs. Write 225 in 5 different and equivalent ways.

**Assessment for Learning**

Refer learners to Exercise 2 on page 55 of the Learners Book.

**Suggested Home Work**

Write these numbers in 3 different and equivalent ways:

1) 25                      2) 98                      3) 467

For additional exercises on this module, refer to pages 27 - 28 of the Workbook.

**Module 12:** Arranging objects in different ways**Content Standard**

**B2.1.1.1:** Count and estimate quantities from 0 to 1000.

**Indicator:**

**B2.1.1.1.5:** Represent number quantities up to 1000 in equivalent ways focusing on place value and equality.

**Learning Expectation**

Learners will be able to arrange objects in different and equivalent ways.

**Essentials for Learning**

Learners can decompose numbers in different and equivalent ways.

**New words**

Arrange, different, left over, equal.

**Resources**

Bottle caps, straws, seeds.

Number of Lessons **2****Lesson 1:** Equal groupings of objects**Starter**

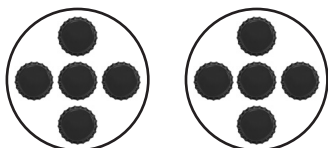
Play "Making 10s". Mention a number and learners say another number to give the sum 10. 1)  $6 \rightarrow 4$  2)  $0 \rightarrow 10$  3)  $3 \rightarrow 7$ .

**Find Out**

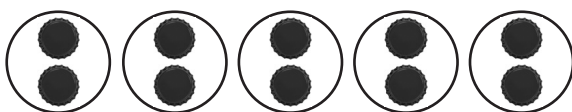
Refer learners to page 56 of the Learner's Book. Deduce from them what they can say about the two groupings. The 15 stars have been re-arranged into 3 equal groups of 5. (*Critical thinking, attention to precision*)

**Let us Learn**

- Learners work in groups of six. Give them 10 bottle caps. They make two groupings of equal numbers.



- Elicit from them how they can make different groupings apart from what they have done.



- Give 20 straws to the groups. Learners make equal groupings and justify their decisions. (*Critical thinking, collaborative learning, justification of ideas*)

- Write the number 30 on the board. Learners find different ways of putting them into equal groupings, 30 as 2 groups of 15 or 3 groups of 10 or 6 groups of 5 or 5 groups of 6.
- Refer to **Let us learn: 1**, on pages 56 - 57 of the Learner's Book. Go through the activities with learners. Learners use counters to make the groupings. (*Critical thinking, collaborative learning, problem solving skills*).

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

- Learners work in pairs. Give out 20 pebbles for them to make three different but equivalent groupings of equal numbers. (*Critical thinking, collaborative learning*)

**High Ability Learners**

- Learners work in pairs. Give out 40 bottle caps for each pair. Learners make 4 different but equivalent groupings of equal numbers. (*Critical thinking, collaborative learning*)

**Assessment for Learning**

- Refer learners to Exercise 1 on page 59 of the Learner's Book.

**Suggested Homework**

Make 3 equal groupings of these numbers:  
1) 30                      2) 18                      3) 24

**Lesson 2:** Grouping objects with left overs**Starter**

Play "Making 10s". Mention a number and learners say a number which adds up to make 10. E.g.

- 1)  $6 \rightarrow 4$       2)  $6 \rightarrow 4$   
3)  $8 \rightarrow 2$       4)  $2 \rightarrow 8$ .

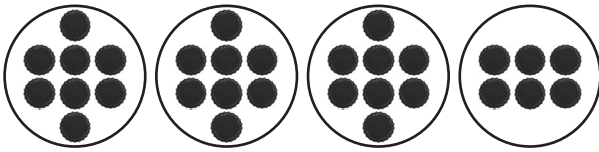
**Let Us Learn**

- Give out 30 bottle caps to learners. In groups of five, learners make 4 groups of 7 with the bottle caps.



4 groups of 7 with 2 left over.

- Arrange the same number of objects into 3 groups of 8



3 groups of 8 with 6 left over.

**(Critical thinking, collaborative learning, problem solving skills)**

- Refer to learner's book page 57 and 58. Go through **Let us learn: 2 and 3** with learners. They re-arrange the 25 objects in different ways that there will be some left over. Let them work in groups.  
**(Collaborative learning, critical thinking, justification of ideas)**

- Now have learners re-arrange 49 objects in different ways so that there will be some remainders or left overs.

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

- Working in groups of four, learners re-arrange 28 marbles in three different ways so that there will be a remainder.

**High Ability Learners**

- Have learners work in pairs. Give out 45 marbles to each pair. Learners make 3 different groupings with some left over.  
**(Critical thinking, collaborative learning, justification of ideas)**

**Assessment for Learning**

Refer learners to Exercise 2 on page 60 of the Learner's Book.

**Suggested Homework**

Arrange these numbers in 1) equivalent ways

2) with some left overs:

- 1) 25      2) 16      3) 40

For additional exercises on this module, refer to pages 29 - 31 of the Workbook.

**Module 13:** Comparing whole numbers using the symbol  $>$ ,  $<$  or  $=$ **Content Standard**

**B2.1.1.1:** Count and estimate quantities from 0 to 1000.

**Indicator**

**B2.1.1.1.6:** Use place value to compare and order whole numbers up to 100 using comparative language, numbers, and symbols ( $>$ ,  $<$  or  $=$ ).

**Learning Expectation**

Learners will be able to compare two numbers using the symbols ( $>$ ,  $<$  or  $=$ ).

**Essentials for Learning**

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

**New words**

Bigger than, smaller than, order, increasing, decreasing.

**Resources**

Numeral cards 1-20, 100 number chart.

Number of Lessons **1**

**Lesson 1:** Comparing 2 numbers**Starter**

Play '1 less'. Mention a number and learners say the number which is 1 less than the number mentioned, e.g.

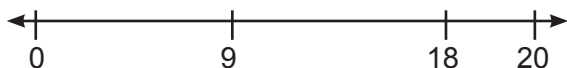
- 1)  $9 \rightarrow 8$       2)  $6 \rightarrow 5$   
3)  $40 \rightarrow 39$       4)  $85 \rightarrow 84$

**Find Out**

Refer to page 63 of the Learner's Book. Working in pairs, learners compare the prices of the bag and the shoes. They determine which price is more than or less than the other and find the difference between them. (**Critical thinking, collaborative learning**)

**Let us Learn**

- Display the number line chart on the board. They should work in groups of five.



- Circle 9 and 18. Learners already know that with movement to the right, the number increases and vice-versa. Let them compare the two numbers 9 and 18. 18 is bigger/larger than 9 and 9 is less/smaller than 18. Elicit from them which symbol will be appropriate to make the statements  $18 > 9$  and  $9 < 18$  true. (**critical thinking, collaborative learning, problem solving skills**)
- Now have learners work in pairs. Give them the symbols ( $>$  and  $<$ ). They use the cards to compare the following numbers:

1.  $68 \underline{\hspace{1cm}} 86$       2.  $243 \underline{\hspace{1cm}} 234$

3.  $689 \underline{\hspace{1cm}} 649$  (**Critical thinking, collaborative learning**)

- Refer learners to Let us learn on page 61 of the Learner's Book. Have learners write the symbol to compare the 2 numbers.

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

- Working in pairs, learners compare these numbers using the correct symbols:  
1)  $63 \underline{\hspace{1cm}} 66$       2)  $123 \underline{\hspace{1cm}} 231$

**High Ability Learners**

- Working in pairs, learners compare these numbers using the correct symbols:  
1)  $685 \underline{\hspace{1cm}} 658$       2)  $729 \underline{\hspace{1cm}} 829$   
3)  $333 \underline{\hspace{1cm}} 331$

**Assessment for Learning**

Refer to page 62 of the Learner's Book for exercise.

**Suggested Home Work**

Use the symbols  $>$  and  $<$  to make the statements true.

- 1)  $43 \underline{\hspace{1cm}} 47$       2)  $187 \underline{\hspace{1cm}} 186$   
3)  $582 \underline{\hspace{1cm}} 588$       4)  $609 \underline{\hspace{1cm}} 608$

For additional exercises on this module, refer to pages 32 - 33 of the Workbook.



**Module 14:** Ordering whole numbers**Content Standard**

**B2.1.1.1:** Count and estimate quantities from 0 to 1000

**Indicator**

**B2.1.1.1.6:** Use place value to compare and order whole numbers up to 100 using comparative language, numbers, and symbols ( $>$ ,  $<$  or  $=$ )

**Learning Expectation**

Learners will be able to order numbers in increasing/decreasing order.

**Essentials for Learning**

Learners can compare two numbers and determine the number which is bigger/smaller than the other.

**New words**

Increasing, decreasing, order, smallest, largest

**Resources**

Numeral cards (1 – 20), 100 number chart.

Number of Lessons **1**

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

Learners count 1 to 20 forward and backwards and clap at the same time.

**Find Out**

Refer learners to page 63 of the Learner's Book. Learners work in groups of six to determine the largest and the smallest number. **(Critical thinking, ollaborative earning)**

**Let us Learn**

- Learners work in groups of four. Give out the numeral cards below to learners. They arrange them in ascending and descending orders.

(1) 

60	15	72	6	30
----	----	----	---	----

(2) 

80	8	45	39	91
----	---	----	----	----

**(Critical thinking, collaborative learning, attention to precision)**

- Now, have learners work in pairs to arrange the numbers below in both ascending and descending orders.  
1) 13, 2, 19, 7      2) 45, 60, 13, 19  
**(Critical thinking, Collaborative Learning)**
- Refer to page 63 of the Learner's Book. Go through **Let us learn** with learners.

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

- Working in pairs, learners re-arrange the numbers below in ascending and descending order: 1) 26, 13, 72, 2  
2) 39, 16, 4, 45

**High Ability Learners**

- Have learners work in pairs. They write 5 different numbers by themselves and order them in ascending and descending order. **(Critical thinking, collaborative learning, attention to precision, problem solving skills)**

**Assessment for Learning**

Refer learners to page 64-65 of the Learner's Book for exercises.

**Suggested Home Work**

Arrange these numbers in increasing and decreasing order:

- 32, 17, 28, 41
- 12, 80, 39, 10
- 16, 54, 92, 13
- 265, 420, 300, 520

For additional exercises on this module, refer to pages 34 - 35 of the Workbook.

**Module 15:** Finding missing numbers**Content Standard:**

**B2.1.1.1:** Count and estimate quantities from 0 to 1000.

**Indicator**

**B2.1.1.1.6:** Use place value to compare and order whole numbers up to 100 using comparative language, numbers, and symbols ( $>$ ,  $<$  or  $=$ ).

**Learning Expectation**

Learners will be able to fill in missing numbers on the number line.

**Essentials for Learning**

Learners can identify and write numbers which are less than/more than the other.

**New words**

Missing, difference, number line.

**Resources**

Straws, bottle caps, number line cards.

Number of Lessons **2****Lesson 1:** Finding missing numbers using the number line

**Starter:** Play "1 more". Mention a number and learners give you a number which is 1 more than the number mentioned.

E.g. 1)  $72 \rightarrow 73$                       2)  $94 \rightarrow 95$   
3)  $17 \rightarrow 18$                       4)  $99 \rightarrow 100$ .

**Find Out**

Refer learners to page 66 of the Learner's Book. Learners working in pairs, look at the number line, read out the numbers and say the numbers that are missing. The missing numbers are "4, 10 and 12". (**Critical thinking, collaborative, learning, leadership, attention to precision**).

**Let us Learn**

- Have learners count by 2s up to 20 and write them on the board: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20. Learners now count by 5s up to 50. Draw a number line on the board. Write the multiples of 5 on the number line as they call out the numbers. (**Collaborative learning, critical thinking**).
- Learners work in groups of five. Give out number line cards with some missing numbers to learners. Let them fill in the missing numbers. (**collaborative, learning, critical thinking**)

- Refer to **Let us learn: 1a and 1b** on page 66 of the Learner's Book and go through the exercise with learners. They fill in the missing numbers.

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

- Give out number line cards 1 to 20; leave out 5 numerals for them to fill. They should work in pairs.

**High Ability Learners**

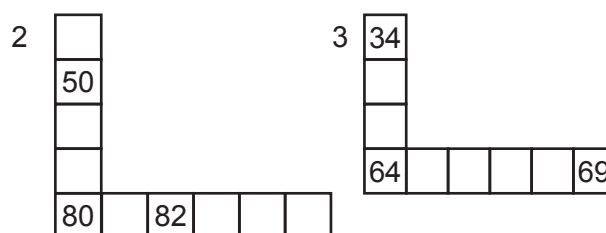
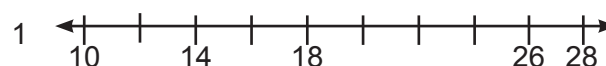
- Give out number line cards from 20 to 50. Leave out 10 numerals for learners to fill in.

**Assessment for Learning**

Refer learners to Exercise 1 on page 68 of the Learner's Book.

**Suggested Home Work**

Fill in the missing numbers.



## Lesson 2: Finding missing numbers using the 100 number chart

### Starter

Learners sing "I'm counting one".

### Let Us Learn

- Have learners work in pairs. Provide them with 100 number charts. Have learners circle the number 52. Learners move right and say 4 numbers, (53, 54, 55, 56) Now, have learners circle 38. Learners move 4 spaces to the left and say the numbers (37, 36, 35, 34). Learners should critically look at the 2 movements and say what they observe about the numbers.
  - Movement to the right, increases the numbers by 1.
  - Movement to the left, decreases the numbers by 1. (**Critical thinking, collaborative learning, attention to precision**)
- Have learners circle the number 33. Let them move down 4 spaces and read out the numbers (43, 53, 63, 73). Using the same number, have learners move up 3 spaces and read out the numbers (23, 13, 3).
- Let learners look at the movements up and down and discuss what they have discovered.
  - Movement down, increases the numbers by 10.
  - Movement up, decreases the numbers by 10. (**Critical thinking, collaborative learning, problem solving skills**)
- Refer learners to **Let us learn: 2** on page 67 of the learner's Book. Go through question 1 and 2 with them. Starting on 23 move 4 spaces to the right and fill in the missing numbers. With question 2, start on 39 and fill in the missing boxes with the appropriate numbers.

### Review Exercise

#### Differentiated Lessons

##### Low Ability Learners

- Give learners 100 number charts. Working in pairs, have them write 4 numbers to the right of 60 and 4 numbers to the left of 52.

##### High Ability Learners

- Working in pairs and using the number chart, learners:
  - Write 3 numbers below and above 42.
  - Write 4 numbers to the left and right of 91; using the 100 number charts.

#### Assessment for Learning

Refer learners to the Learner's Book on page 69 for exercises.

#### Suggested Home Work

Learners fill in the missing numbers on the number line.

1	2	3	4	5	6	7	8	9	10
		13			16	17		19	20
21	22	23	24	25	26	27	28	29	30
31		33	34		36	37	38	39	
41	42	43	44	45	46	47	48		50
51	52	53	54	55	56	57		59	60
61	62	63	64	65		67	68	69	70
	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86			89	90
91	92	93	94	95		97	98	99	100

For additional exercises on this module, refer to pages 36 - 37 of the Workbook

**Module 16:** Word problems involving comparison**Content Standard**

**B2.1.1.1:** Count and estimate quantities from 0 to 1000

**Indicator**

**B2.1.1.1.6:** Use place value to compare and order whole numbers up to 100 using comparative language, numbers, and symbols ( $>$ ,  $<$  or  $=$ ).

**Learning Expectation**

Learners will be able to solve word problems involving comparing of quantities.

**Essentials for Learning**

Learners can solve addition and subtraction problems within 20.

**New words**

Compare, how many.

**Resources**

Straws, bottle caps.

Number of Lessons **1****Lesson 1:** Word problem (comparison)**Starter**

Learners count forwards and backwards in 2s up to 20.

**Find Out**

Refer learners to page 70 of the Learner's Book. Learners compare the number of mangoes Kweku and Akua are having. They say who has more and who has less. "Kweku has more mangoes than Akua, or Akua has less mangoes than Kweku."

**Let us Learn**

- Call a boy and a girl to the front of the class. Give 10 straws to the girl and 8 straws to the boy.
- Learners pose a word-problem for it. "Mama Adwoa gave 10 straws to Ahmed and 8 straws to Fatima. Who has less straws? Learners come out with the answer "Fatima". (**Critical thinking, problem solving skills, personal development**)
- Learners work in groups of five. Give each group 30 straws. Learners pose their own word problem by using the straws. E.g. The leader gives 20 straws to a learner and 10 straws to another. They determine the one who has more or less straws. (**Critical thinking, collaborative learning**)

- Refer to **Let us learn** on pages 70 and 71 of the Learner's Book. Learners compare the number of fruits sold by Maame Esi and Madam Adjoa and identify the one who sold more or less. Go through the rest of the questions with them. (**Critical thinking, collaborative learning, attention to precision**)

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

- Give 20 straws to each group of learners. In groups of five, they pose word problems, using the straws. E.g. I have 12 straws, I give 5 to Akosua, who has more straws?

**High Ability Learners**

- Using the same procedure as above, have learners pose word problems using 60 straws. E.g. Yaw has 38 straws, Dele has 28, who has more/less? Have them work in groups of 4.

**Assessment for Learning**

Refer learners to Exercise 1 and 2 on pages 71 and 72 of the Learner's Book.

**Suggested Home Work**

Compare the two scenarios in each of the following:

- 1 Akweley has 25 Alacha, Oko has 52. Who has more and who has less Alacha?

- 2 Seidu has 28 kola nuts, Dele has 39. Who has more and who has less?
- 3 Mr. Ohene is 45 years old, Mr. Asienim is 54 years old. Who is older and who is younger than the other?

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

Encourage learners to do the reflection exercises on pages 73 and 74 after this sub-strand.

Learners complete the self-assessment table on page 75. This will help you know each learner's strength and weaknesses.

## Module 1: Addition of whole numbers

**Content Standard**

**B2.1.2.1:** Demonstrate conceptual understanding of operations of addition and subtraction with sums up to 100.

**Indicator**

**B2.1.2.1.1:** Use conceptual understanding of addition and subtraction to add, and subtract numbers to 100.

**Learning Expectation**

Learners will be able to identify that, adding two numbers in any order does not change the answer.

**Essentials for Learning**

Learners can add two numbers with sum up to 20.

**New words**

Add, order, added, sum.

**Resources**

Bottle caps, straws.

Number of Lessons 2

**Lesson 1:** Adding 2 numbers in any order

Learners sing the song "1, 2, Buckle my shoe".

**Find Out**

Let learner's work in pairs. Refer them to **Find out: A** on page 76 of the Learner's Book. Have learners tell you what they can say about the two number sentences. Let them work it out and talk about the 2 answers;  $18 + 5 = 23$  and  $5 + 18 = 23$ . (**Critical thinking, collaborative learning**)

**Let Us Learn**

- Using straws, learners work these out in pairs:  $6 + 9$  and  $9 + 6 = 15$ . Write these addition sentences on the board. Let learners find solutions by using straws and sticks.

$$1) 8 + 3 = \square \text{ and } 3 + 8 = \square$$

$$2) 10 + 5 = \square \text{ and } 5 + 10 = \square$$

- Have learners deduce why they get the same answer. (**Critical thinking, collaborative learning**)
- Refer to **Let us learn: 1** on page 76 of the Learner's Book. Working in groups of 4, learners solve the problem  $18 + 40 = ?$  and  $40 + 18 = ?$  Have learners compare their answers with that of other groups. (**Collaborative learning**)

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

- Working in pairs, learners solve these problems:
  - $6 + 8 = ?$  and  $8 + 6 = ?$
  - $10 + 4 = ?$  and  $4 + 10 = ?$

**High Ability Learners**

- Have learners work in pairs and solve these problems:
  - $12 + 8 = ?$  and  $8 + 12 = ?$
  - $26 + 10 = ?$ ,  $10 + 26 = ?$

**Assessment for Learning**

Refer learners to page 77 and 78 of the Learner's Book for exercises.

**Suggested Homework**

Learners solve these and justify their answers:

- $20 + 15 = ?$  and  $15 + 20 = ?$
- $7 + 9 = ?$  and  $9 + 7 = ?$
- $17 + 10$  and  $10 + 17$
- $16 + 6 = ?$  and  $6 + 16 = ?$



**Lesson 2:** Adding 3 numbers in any order**Starter**

Learners recite the rhyme “1, 2, Buckle my shoe”.

**Find Out**

Refer to **Find out: B** on page 76 of the Learner’s Book. Learners working in pairs solve the addition sentence and justify why they are getting the same answer.

*(Critical thinking, collaborative learning, justification of ideas).*

**Let Us Learn**

- Give out 30 straws to each group. Write these addition sentences on the board.  
 $5 + 4 + 2 =$   
 $2 + 4 + 5 =$
- Have learners work in pairs. They count straws for these numbers and add them. They should compare their answers to those of the other group members. Repeat this activity with different numbers, e.g.  $10 + 6 + 4 = ?$   $6 + 4 + 10 = ?$
- Refer to **Let us learn: 2** on page 76 of the Learner’s Book. Go through the exercises with them;  
 $4 + 16 + 5 = 25$   
 $5 + 4 + 16 = 25$   
 $16 + 4 + 5 = 25$ ,  
 Repeat this exercise with different numbers. *(Collaborative learning, justification of ideas, attention to precision)*

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

- Give these numbers to learners to solve in pairs:

$$5 + 10 + 2 = \square \quad 10 + 2 + 5 = \square$$

**High Ability Learners**

- Have learners work in pairs. Learners write their own two addition sentences with 3 numbers and solve them.

**Assessment for Learning**

Refer learners to Exercise 2 on page 78 of the Learner’s Book.

**Suggested Homework**

Solve these:

$$1) \quad 6 + 4 + 3 = \square \quad 4 + 6 + 3 = \square$$

$$2) \quad 9 + 2 + 1 = \square \quad 1 + 2 + 9 = \square$$

$$3) \quad 16 + 4 + 10 = \square \quad 10 + 4 + 16 = \square$$

For additional exercises on this module, refer to pages 40 - 41 of the Workbook.

## Module 2: Adding or subtracting zero (0)

## Content Standard

**B2.1.2.1:** Demonstrate conceptual understanding of operations of addition and subtraction with sums up to 100

## Indicator

**B2.1.2.1.1:** Use conceptual understanding of addition and subtraction to add, and subtract numbers to 100

## Learning Expectation

Learners will be able to identify that, adding or subtracting '0' from any number gives the same initial number.

## Essentials for Learning

Learners can add two numbers with sum up to 20.

## New words

Zero, nothing, add, take away, same as, sum.

## Resources

straws, bottle caps.

Number of Lessons 1

## Lesson 1: Adding or subtracting zero (0) from a number

## Starter

Have learners clap and count forwards and backwards, (1 – 20).

## Find Out

Refer learners to page 79 of the Learner's Book. Working in pairs, they look at the pictures and talk about what they see in the 3 bowls. They discuss and come out with a solution. E.g. what must be added to 3 to get 3?

## Let us Learn

- Have learners work in groups of six. Call a boy to the front of the class.
- Give him 4 books. Have learners count with him. Pretend to be adding nothing to his. Ask learners "how many books did I add"? and learners say "nothing was added". So Oko still has 4 books. Act out similar scenarios with learners. "I have ₦20.00, nobody gave me more, so how many cedis do I have now?" "₦20.00".
- I have 2 cars in my house, my children have not given me another, so how many cars do I have? Deduce from learners what happens when you add zero (0), to a number. The number remains the same.
- Refer to **Let us Learn: 1** on page 79 of the Learner's Book. Have learners act out the scenario. E.g. "I have 7 balloons; none burst so I still have 7 balloons".
- Refer to **Let us Learn: 2** on page 80 of the Learner's Book. Go through the activity with learners. Have learners act some scenarios on their own, e.g. "I have 10

straws" I have taken out zero (0). How many do I have now?" The answer is the same 10 (**Critical thinking, collaborative learning, attention to precision**).

- Go through the examples on page 80 of the Learner's Book. Learners act out the word problems. Call them to the front of the class to act out the stories.

**If you add or subtract 0 from any number, the answer is the same number.**

## Review Exercise

## Differentiated Lessons

## Low Ability Learners

- Have learners work in pairs and solve these;

$$1) 15 + 0 = \square \quad 2) 25 + 0 = \square$$

$$3) 17 - 0 = \square$$

## High Ability Learners

- Have learners work in pairs. They write their own 2 addition and 2 subtraction sentences and solve them.

## Assessment for Learning

Refer learners to page 81 of the Learner's Book for exercise.

## Suggested Homework

Work these

$$1) 25 + 0 = \square \quad 2) 6 + 0 = \square$$

$$3) 10 + 0 = \square \quad 4) 32 + 0 = \square$$

For additional exercises on this module, refer to pages 42 - 43 of the Workbook.

**Module 3:** Finding missing numbers.**Content Standard:**

**B2.1.2.1** Demonstrate conceptual understanding of operations of addition and subtraction with sums up to 100

**Indicator:**

**B2.1.2.1.1** Use conceptual understanding of addition and subtraction to add, and subtract numbers to 100

**Learning Expectation**

Learners will be able to find the missing addend, subtrahend and minuend in addition/subtraction sentences.

**Essentials for Learning**

Learners can solve addition and subtraction sentences within 20.

**New words**

Minuend, subtrahend, addend, same as.

**Resources:**

Straws, sticks, bottle caps.

Number of Lessons **3**

**Lesson 1:** Finding the missing addend.**Starter**

Play "Guess My Number".

I have a number in my mind. It is less than 20 but more than 18, what is my number? The number is 19.

**Find Out**

Refer to page 82 of the Learner's Book.

Learners work in pairs to guess how many pebbles are left in the bottle. Let them count to find the actual quantity.

**Let Us Learn**

- Have learners work in groups of six. Pose word problems for them. E.g. I have 10 notebooks, the head teacher gave me some more. I now have 16. How many did the headteacher give me?
- Learners write the addition sentence down as follows:  $10 + \text{what} = 16$ , Learners change the addition sentence to a subtraction sentence and solve it:  $10 + \text{what} = 16 \rightarrow 16 - 10 = 6$ . The headteacher gave me 6 more notebooks. (**Critical thinking, collaborative learning, attention to precision**)
- Collect 20 bottle caps. Say, "I have 20 bottle caps". Show the caps to learners. Call a learner to come and add 8 more without letting the class know the number. Tell them you now have 28. Ask learners to say how many were added?
- Learners write the addition sentence, change it to a subtraction sentence and solve it.  $20 + ? = 28 \rightarrow 28 - 20 = ?$

$28 - 20 = 8$  so Esi gave me 8 more (**Critical thinking, collaborative learning**).

- Refer learners to **Let us learn: 1** on page 83 of the Learner's Book. Learners solve  $32 + ? = 65$ .
- Have learners change it to subtraction sentence and solve it.  
So  $32 + ? = 65$ .  
becomes  $65 - 32 = ?$   $65 - 33 = 32$   
So  $32 + 33 = 65$

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

- Working in pairs, learners solve the following problems;  
1)  $15 + ? = 45$   
2)  $20 + ? = 32$

**High Ability Learners**

- Learners work in pairs and solve the problems below;  
1)  $78 + ? = 100$   
2)  $31 + ? = 62$

**Assessment for Learning**

Refer learners to page 84 of the Learner's Book for exercise.

**Suggested Home Work**

Solve these:

- $33 + ? = 40$
- $28 + ? = 62$
- $82 + ? = 100$
- $75 + ? = 99$

## Lesson 2: Finding the missing subtrahend

### Starter

Play “1 less”. Mention a number and learners subtract 1 from it and say it out loud. E.g.

- 1)  $2 \rightarrow 1$       2)  $65 \rightarrow 64$       3)  $88 \rightarrow 87$

### Find Out

Refer to page 82 of the Learner’s Book. Have learners say the number of pebbles on the right hand side of the bottle. Learners guess the number first before counting. (Actual number of pebbles is 11.)

### Let us Learn

- Learners work in groups of five. They solve the following problem:
- Koo has 36 fowls. He sold some of them. He now has 16 fowls. How many did he sell? Learners brainstorm and write a subtraction sentence. The problem could be written as  $36 - \text{what} = 16 \rightarrow 36 - ? = 16$ . This is the same as what must be added to 16 to get 36 that is  $16 + ? = 36$ . Learners can use the count on strategy to find the answer. (**Critical thinking, collaborative learning, problem solving skills**)
- Repeat this activity with different word problems.
- Have learners pose their own word problems, identify where the subtrahends are, write subtraction sentences and solve them.
- Refer to the **Let us Learn: 2** on page 83 of the Learner’s Book. Go through the exercise with learners.

### Review Exercise

#### Differentiated Lessons

##### Low Ability Learners

- Working in pairs, learners write a subtraction sentence for the statement below and solve it.
  - There were 24 books in the cupboard. Teacher Kwesi gave some to the best learners. 18 books are left now. How many books did he give to the best learners?
- 1)  $24 - \square = 18$        $18 + ? = 24$

##### High Ability Learners

- Working in pairs, learners write one subtraction sentence with a missing

subtrahend and solve it. E.g. I have 30 mangoes. I gave some to my teacher. I now have 18. How many mangoes did I give out?

### Assessment for Learning

Refer learners to Exercise 2 on page 85 of the Learners’ Book.

### Suggested Home Work

Work these

1)  $60 - \square = 40$

2)  $92 - \square = 80$

3)  $86 - \square = 60$

4)  $100 - \square = 70$

## Lesson 3: Finding the missing minuend

### Starter:

Play “2 less”. Say a number Learners say a number which is 2 less than it. E.g.

- 1)  $28 \rightarrow 26$       2)  $90 \rightarrow 88$       3)  $78 \rightarrow 76$

### Find Out

Refer to page 82 of the Learner’s Book. Have learners say the number of pebbles on the left hand side of the bottle. Learners guess the number first before counting. (Actual number of pebbles is 31.)

### Let us Learn

- Put learners into groups of five. Give word sentence cards to learners to write a subtraction sentence for each card and solve it. E.g. I have a number of crayons I gave 20 to Efe. I now have 25. How many crayons did I have initially?  $\square - 20 = 25$ . Deduce from learners how they will solve it. This could be explained as what  $- 20 = 25$ . The statement can be re-written as  $20 + ? = 25$ . Learners can use count on strategy to get the answer. (**Critical thinking, collaborative learning, problem solving skills**)
- Repeat similar questions for learners to solve e.g.

1)  $\square - 10 = 20$

2)  $\square - 15 = 30$ .

- Refer to the Learner's Book page 83. Go through **Let us learn: 3** with learners.

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

- Write these sentences for learners to solve in pairs:

1)  $\square - 6 = 10$

2)  $\square - 10 = 10$

**High Ability Learners**

- Working in pairs, have learners solve these:

1)  $\square - 15 = 30$

- 2) Mensah gave 10 pencils to his friend. He now has 20. How many pencils did he have initially?

**Assessment for Learning:**

Refer learners to Exercise 3 on page 85 of their Learner's Book.

**Suggested Home Work**

Solve these:

1)  $\square - 10 = 40$

2)  $\square - 10 = 75$

1)  $\square - 20 = 75$

2)  $\square - 80 = 20$

For additional exercises on this module, refer to pages 44 - 46 of the Workbook.

**Module 4:** Addition and subtraction word problems**Content Standard:**

**B2.1.2.1.** Demonstrate conceptual understanding of operations of addition and subtraction with sums up to 100

**Indicator:**

**B2.1.21.1** Use conceptual understanding of addition and subtraction to add, and subtract numbers to 100

**Learning Expectation**

Learners will be able to: write addition sentence and word problems for a given sum.

**Essentials for Learning**

Learners can solve addition sentences and word problems that give the sum up to 20.

**New Words**

Solution, addition, subtraction, sum, difference.

**Resources**

Pebbles, solution/answer cards.

Number of Lessons **2**

### Lesson 1: Creating addition sentences and word problems for a given solution/answer

**Starter:**

Play "One more than". Mention a number and learners say a number which is 1 more than that number.

(1) 67 → 68 (2) 89 → 90 (3) 400 → 401

**Find out**

Refer learners to **Find out: A** on page 86 of the Learner's Book. Learners solve the two addition sentences in pairs. Have them make other statements that show that different addition sentences can give the same solution.

**Let Us Learn**

- Write the number 72 as a solution to a question on the board.
- Explain to learners that additions have been done that resulted in an answer 72. Ask them to write several addition sentences and word problems that will give the answer as 72.
- Working in groups of five, learners write two additions sentences for the solution.

$$20 + 52 = 72$$

$$42 + 30 = 72$$

**(Critical thinking, collaborative learning, problem solving skills)**

- With the same number 72 written on the board, ask learners, still in their groups

to create more word problems with the solution 72.

- Every learner in the group should act out a story. E.g.
  - Mummy has 60 birds. Daddy brought her 12 more. Mummy now has 72 birds.
  - A carpenter made 42 chairs on Monday and 30 chairs on Tuesday. For the two days, he made 72 chairs. **(Critical thinking, collaborative learning, problem solving skills, personal development)**
- Refer to **Let us learn: 1** on page 86 and 87 of the Learner's Book. Each learner in the group write an addition sentence for the solution **98**.
- Go through the word problems with learners. Each group creates problems for the solution provided. **(Critical thinking, collaborative learning)**

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

- Working in pairs, learners write 2 addition sentences for the solution **30**.

**High ability Learners**

- Have learners work in pairs. They write an addition sentence and a word problem for the solution 88.

**Assessment for Learning**

Refer Learners to Exercise 1 on page 89 of the Learner's Book.



**Suggested Home Work**

Write 2 addition sentences and 2 word problems for the following solution:

(1) 60

(2) 44

## Lesson 2: Creating subtraction sentences and word problems for a given solution

**Starter:**

Play "One less". Mention a number and learners say a number which is 1 less.

1) 60 → 59    2) 79 → 78    3) 69 → 68

4) 243 → 242

**Let Us Learn**

- Have learners work in groups of five. Write the number 40 as a solution on the board. Explain to learners that a subtraction operation has been done and the result is 40. They should write subtraction sentences which will give the answer 40 as the difference. Have learners select their own leader to ensure that every learner takes part in the activity. Examples of subtraction sentences could be:

1)  $60 - 20 = 40$     2)  $80 - 40 = 40$ .

**(Critical thinking, collaborative learning, leadership skills)**

- Similarly, a word problem could be posed for the same solution/answer.

E.g. Maame Fosuah has 60 hens. She sold 20 of them. She has 40 now.

- Refer to **Let us Learn: 2** on pages 87 and 88 of the Learner's Book. Go through the examples with learners.
- Learners write their own subtraction sentence and play/act out scenarios for the solution. **(Critical thinking, collaborative learning, problem solving skills)**

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

- Work in pairs. Write subtraction sentences for the following answers:  
1) 35    (2) 30

**(High Ability Learners)**

- Work in pairs. Write one subtraction sentence and one word problem for the following answers/solutions: 1) 69    2) 86

**Assessment for Learning**

Refer learners to Exercise 2 on page 90 of the Learner's Book.

**Suggested Home Work**

Write 2 subtraction sentences and 2-word problems for the following solutions/answers:

1) 35

2) 59

3) 95

For additional exercises on this module, refer to pages 47 - 49 of the Workbook.

**Module 5:** Addition and subtraction of whole numbers using “= and  $\neq$ ” signs**Content Standard**

**B2.1.2.2:** Demonstrate an understanding of the concept of “not equal to” to solve addition and subtraction problems with sums up to 100.

**Indicator**

**B2.1.2.2.1:** Use the concept of “equal to” and “not equal to” to solve addition and subtraction problems with sums up to 100

**Learning Expectation**

Learners will be able to use the concept of equals to (=) and not equals to ( $\neq$ ) symbols

to solve addition problems with sums up to 100.

**Essentials for Learning**

Learners can add two numbers with sum up to 100.

**New words**

Equal to, not equal to, same as, symbols.

**Resources**

Straws, bottle caps, number line cards.

Number of Lessons **2**

**Lesson 1:** Addition of whole numbers (sum up to 100)**Starter**

Play “Making 10s”. Hold up a number of fingers. Learners say a number which when added makes 10.

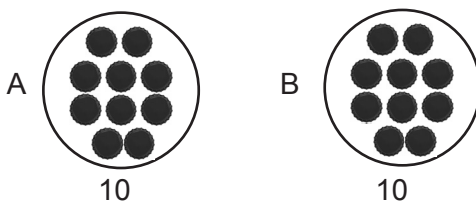
- |   |                    |
|---|--------------------|
| 1 | 0 $\rightarrow$ 10 |
| 2 | 6 $\rightarrow$ 4  |
| 3 | 1 $\rightarrow$ 9  |

**Find Out**

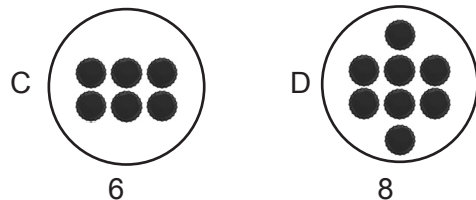
Refer learners to page 91 of the Learner's Book. Learners compare the number of learners to the number of bags. Have them observe the picture critically and explain that the bags are not enough for all the learners. There are fewer bags than the learners and more children than the bags. (**Critical thinking**).

**Let us Learn**

- Explain the concepts of “equal to” and “not equal to” to learners.



- The number of objects in A is equal to the number of objects in B as shown above. Learners should know that “equal to” means “same as”. The number of objects in A is the same as the number of objects in B. Introduce the symbols “=” to learners.



- The number of objects in C is not the same as the number of objects in D as shown above. C is not equal ( $\neq$ ) to D. (**Critical thinking, collaborative learning**)
- Solve these with learners.
  - $20 + 16 = 36$ ,  $30 + 6 = 36$ .  
And  $36 = 36$ .  
Therefore  $20 + 16 = 30 + 6$ .
  - $42 + 12 = 54$ ,  $40 + 12 = 52$ .  
And  $54 \neq 52$ .  
Therefore  $42 + 12 \neq 40 + 12$ .
- Refer to **Let us learn: 1** on pages 91 and 92 of the Learner's Book. Go through the exercises with learners using = and  $\neq$  symbols.

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

- Use the symbol = and  $\neq$  to make the statements true.

- $50 - 45$
- $65 - 56$
- $73 - 73$

**High Ability Learners**

- Use the symbols = and  $\neq$  to make the statements true.

- $25 + 5$  \_\_\_  $30$
- $13 + 20$  \_\_\_  $20 + 31$
- $60$  \_\_\_  $50 + 10$

**Assessment for Learning**

Refer learners to Exercise 1 on page 93 of the Learner's Book.

**Suggested Home Work**

Use the symbols = or  $\neq$  to make the statements true.

$$\begin{array}{rcl} 20 + 12 & \underline{\hspace{1cm}} & 30 \\ 35 + 30 & \underline{\hspace{1cm}} & 65 \\ 90 + 10 & \underline{\hspace{1cm}} & 100 \\ 40 + 10 & \underline{\hspace{1cm}} & 15 + 40 \end{array}$$

**Lesson 2:** Subtraction of whole numbers (up to 100)**Starter**

Play "2 less than". Call out a number. Have learners say a number that is 2 less than that number. E.g.

$$13 \longrightarrow 11 \quad 29 \longrightarrow 27 \quad 45 \longrightarrow 43$$

**Let Us Learn**

- Repeat the concept of equal to and not equal to with learners.
- Put learners into groups of five. Give them subtraction sentence cards, e.g.  $15 - 2 = ?$ ,  $20 - 10 = ?$ . Let them find the answer to each sentence and compare them using = or  $\neq$ . (**Critical thinking, Collaborative Learning**)

- Do the following exercises with the class.

a)  $28 - 14$    $37 - 23$ ,

b)  $52 - 35$    $43 - 35$

a)  $28 - 14 = 14$

$$37 - 23 = 14$$

$$14 = 14$$

So  $28 - 14$    $37 - 23$

b)  $52 - 35 = 17$

$$43 - 32 = 11$$

$$17 \neq 11$$

So  $52 - 35$    $43 - 32$

- Write the following number sentences on the board. Have learners determine whether the answers are equal to or not equal to. Let them justify their answers.

1)  $25 = 65 - 40$    $30 = 45 - 15$

2)  $25 \neq 55 - 25$    $30 \neq 40 - 20$

(**Critical thinking, collaborative learning**)

- Refer to **Let us learn: 2** on page 92 of the Learners Book. Go through the exercises with learners using = and  $\neq$  symbols.

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

- Use the symbols = and  $\neq$  to complete the number sentences.

1)  $46 - 29 \dots\dots 17$       2)  $18 - 10 \dots\dots 12$

3)  $27 - 17 \dots\dots 10$       4)  $33 - 18 \dots\dots 15$

**High Ability Learners**

- Use the symbols = and  $\neq$  to make the number sentence to true.

1)  $62 - 38 \dots\dots 38 - 62$

2)  $74 - 52 \dots\dots 52 - 38$

3)  $77 - 49 \dots\dots 78 - 32$

4)  $87 - 43 \dots\dots 100 - 50$

**Assessment for Learning**

Refer learners to Exercise 2 on page 93 of the Learner's Book.

**Suggested Home Work**

Use the symbols = and  $\neq$  to make the statements true.

1)  $29 - 18 \dots\dots 18$

2)  $47 - 29 \dots\dots 16$

3)  $62 - 19 \dots\dots 19 - 62$

4)  $74 - 25 \dots\dots 68 - 19$

For additional exercises on this module, refer to pages 50 - 52 of the Workbook.

## Module 6: Relationship between addition and subtraction

## Content Standard

**B2.1.2.2:** Demonstrate an understanding of the concept of "not equal to" to solve addition and subtraction problems with sums up to 100.

## Indicator

**B2.1.2.2.1:** Use the concept of "equal to" and "not equal to" to solve addition and subtraction problems with sums up to 100.

## Learning Expectation

Learners will be able to: identify the relationship between addition and subtraction

by describing a subtraction as an equivalent addition and vice-versa.

## Essentials for Learning

Learners can use the symbols '=' and '≠' to make addition and subtraction sentences true.

## New words

Equivalent, add, subtract

## Resources

Numeral cards (1 to 20), straws, bottle caps.

Number of Lessons **2**

## Lesson 1: Changing Addition sentences to Subtraction sentences

## Starter

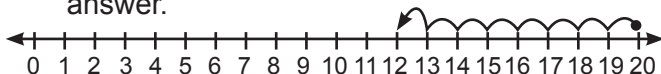
Play "Making 10s": Say a number and learners add another number that gives a sum of 10.  
E.g. 1)  $1 \rightarrow 9$       2)  $6 \rightarrow 4$       3)  $0 \rightarrow 10$

## Find Out

Refer learners to page 94 of the Learner's Book. In pairs, learners describe what they see in the picture. Expected answers: water is being poured into the bucket while it is being drawn out at the same time. This means addition and subtraction are going on simultaneously. (**Critical thinking, collaborative learning, problem solving skills**)

## Let us Learn

- Write an addition sentence on the board. working in groups of five, learners change the addition sentence to subtraction sentence and solve it. E.g.  $12 + \square = 20$
- This means  $12 + \text{what} = 20$ . This could be changed to  $20 - \text{what} = 12$ . Learners can count back from 20 to 12 to get the answer.
- Learners count the number of steps from 20 to 12 on the number line to get the answer.



The number of steps from 20 to 12 is 8.

Therefore  $20 - \square 8 = 12$ .

- Repeat this activity with different questions. (**critical thinking, collaborative learning**).
- Have learners practice in groups with these sentences. They exchange their work with different groups and compare their answers.
- $30 + ? = 45$       2)  $27 + ? = 40$
- Refer to **Let us learn: 1** on page 94 of the Learner's Book. Learners change the addition sentences into subtraction sentences and solve the problem:  $14 + \square = 22 \rightarrow 22 - \square = 14$  (**Critical thinking, collaborative learning**)

## Review Exercise

## Differentiated Lessons

## Low Ability Learners

- Change these addition sentences into subtraction sentences and solve them. Learners work in pairs.

1)  $10 + \square = 15$       2)  $22 + \square = 30$

## High Ability Learners

- Working in pairs, learners change the addition sentences into subtraction sentences and solve them.

1)  $\square + 64 = 80$       2)  $36 + \square = 56$   
3)  $72 + \square = 100$

**Assessment For Learning**

Refer learners to exercise 1 on page 95 of the Learner's Book.

**Suggested Home Work**

Change these addition sentences into subtraction sentences and solve them.

$$1) \square + 17 = 34 \quad 2) 56 + \square = 70$$

$$3) \square + 32 = 60 \quad 4) 19 + \square = 51$$

## Lesson 2: Changing subtraction sentences into addition sentences

**Starter**

Play "1 less". Say a number and learners reduce it by 1 and say it out loud.

E.g. (1)  $52 \rightarrow 51$  (2)  $45 \rightarrow 44$   
(3)  $69 \rightarrow 68$  (4)  $100 \rightarrow 99$

**Find out:**

Refer learners to page 95 of the Learner's Book. Have them explain what they see in the picture. "Addition and Subtraction are going on at the same time".

**Let us Learn**

- Put learners into groups of five. Write the question  $20 - \square = 15$  on the board. Have learners explain what that subtraction sentence means. It means  $20 - \text{what} = 15$ . Learners change it into an addition sentence and solve it. So  $20 - \text{what} = 15$  also means  $\text{what} + 15 = 20$ ;  $15 + \square = 20$ .
- Learners count on from 15 to 20 to get the answer. (**Critical thinking, collaborative learning, attention to precision**)
- Have learners work these in pairs.  
(1)  $26 - \square = 18$  (2)  $30 - \square = 10$ .  
Learners exchange their work with other groups to compare their answers. (**Critical thinking, collaborative learning**)

- Refer learners to **Let us learn: 2** on page 95 of the Learner's Books. Go through the exercises with them.

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

Change these subtraction sentences into addition sentences and solve them.

$$(1) 25 - \square = 10$$

$$(2) 17 - \square = 12$$

**High Ability Learners**

- Change these subtraction sentences into addition sentences and solve them.

$$(1) 29 - \square = 13 \quad (2) 68 - \square = 40$$

$$(3) 59 - \square = 39$$

**Assessment for Learning**

Refer learners to Exercise 2 on page 96 of the Learner's Book.

**Suggested Home Work**

Change these subtraction sentences into addition sentences and write the answers down.

$$(1) 40 - 15 = \square \quad (2) 68 - \square = 18$$

$$(3) 65 - \square = 30 \quad (4) 33 - \square = 26$$

For additional exercises on this module, refer to pages 53 - 55 of the Workbook.

**Module 7:** Addition and subtraction facts (fluency 1)**Content Standard**

**B2.1.2.3:** Develop and use strategies for mentally computing basic additions and subtraction facts to 19

**Indicator**

**B2.1.2.3.1:** Use mental strategies for basic addition facts to 19 and related subtraction facts to 19

**Learning Expectation**

Learners will be able to use mental strategies to find basic addition facts up to 19.

**Essentials for Learning**

Learners can mentally find numbers 1 less or 1 more; 2 more or 2 less than a given number.

**New words**

Less than, more than, 10 more.

**Resources**

Bottle caps, Straws, number line (1 to 20), 100 number chart.

Number of Lessons **1****Lesson 1:** Addition Facts (1, 2 or 10 less than/more than)**Starter**

Play "1 less, 1 more". Mention a number and learners give a number which is 1 less and 1 more than the number. E.g. (1) 10, 1 less is 9 and 1 more is 11 (2) 8, 1 less is 7 and 1 more is 9.

**Find Out**

- Refer learners to the Learner's Book page 97. Learners work in pairs. They look and compare the ages of Dede, Tetteh, Yaba and Blay. What can they say?
- Tetteh is 10 years older than Blay.
- Blay is 1 year older than Dede. Dede is 1 year younger than Blay. Yaba is 2 years older than Blay. Blay is 2 years younger than Yaba. (*Critical thinking, justification of ideas, collaborative learning, problem solving skills*)

**Let us Learn**

- Draw a number line on the board.
- Mention a number and learners also mention a number which is 1 less or more, 2 less or more.  
(1) 14: 1 less is 13 (2) 18: 1 less is 17  
(3) 16: 2 less is 14 (4) 14: 1 more is 15  
(5) 18: 1 more is 19 (6) 16: 2 more is 18  
(*Critical thinking, collaborative learning*)
- Give out number line cards to each group. They play 1 more, 1 less, 2 more, 2 less. Learners select a leader, who calls out a number and the rest give a

number that is 1 more, 1 less or 2 more, 2 less (*Leadership skills, collaborative learning, critical thinking*)

- Give out 100 number chart to learners grouped in fives. The leader calls out a number, the rest look at the chart, and find a number which is 10 more and 10 less. Movement upwards decreases by 10 and movement downwards increases by 10.
- Refer learners to page 97 to 98. Go through **Let us learn: 1** and **2** with learners.

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

- Learners to write 1 less, 2 less:  
(1) 25 (2) 56  
Write 10 more and 10 less:  
(3) 86 (4) 34

**High Ability Learners**

- Refer to the Learner's Book page 98 question 4 but change, 44 to 58.

**Assessment for Learning**

Refer learners to Exercise 1 and 2 on pages 98 - 99 of the Learner's Book.

**Suggested Home Work**

- Refer to page 98 of the Learner's Book questions 2 but change 65 to 45 and 58 to 38.
- For question 3, change 42 to 41 and 32 to 29.

For additional exercises on this module, refer to pages 56 - 57 of the Workbook



**Module 8:** Doubles of numbers (1–12)**Content Standard**

**B2.1.2.3:** Develop and use strategies for mentally computing basic additions and subtraction facts to 19

**Indicator**

**B2.1.2.3.1:** Use mental strategies for basic addition facts to 19 and related subtraction facts to 19

**Learners Expectations**

Learners will be able to identify doubles of numbers between 1 and 12.

**Essentials for Learning**

Learners can add numbers with sum up to 20 and can play “Making 5s and 10s”.

**New words**

Double, twice.

**Resources:** 100 number chart for each pair of learners, straws, bottle caps.

Number of Lessons **1****Lesson 1:** Finding doubles of numbers**Starter**

Play “Making 5s”. Call out a number (0 to 5). Learners call out a number that must be added to that number to make 5.

- (1)  $0 \rightarrow 5$       (2)  $3 \rightarrow 2$       (3)  $5 \rightarrow 0$   
(4)  $1 \rightarrow 4$

**Find Out**

Refer learners to the Learner's Book page 100. Learners look at the two pictures and critically compare the number of apples in the bowls. The number of apples in B is twice that of A, or the number of apples in B is double that of A.

**Let Us Learn**

- Call two learners (a girl and a boy) to the front of the class. Tell the class to double the number of learners in front. They are to call 2 girls and 2 boys (4 learners) to the front of the class. Double of 2 learners is 4 learners. (**Critical thinking, collaborative learning**)
- Give out straws to learners in their groups. Call out a number, e.g. 3 and learners pick 3 straws. Now tell them to double the number of straws. They pick an additional 3 straws and add them to make 6. So double of 3 is 6.
- Have learners play doubles in pairs. One calls a number between 1 – 10, the other doubles it by picking up straws to show it. E.g. One person calls out “2” and the partner shouts “4” and picks up 4 straws. They repeat the activity in turns till they get

to 10. (**Critical thinking, collaborative learning, attention to precision**)

- Refer learners to **Let us learn** on page 100 of the Learner's Book. Explain to learners that to double a number we add the same number to the original number. Refer to the 100 number chart. To get double of 9. Start on 9, count 9 steps forward and you will be on 18, so double of 9 is 18.

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

Double these numbers:

- (1)  $2 =$   
(2)  $4 =$   
(3)  $5 =$

**High Ability Learners**

Double these numbers

- (1)  $7 =$     (2)  $11 =$     (3)  $12 =$     (4)  $8 =$

**Assessment for Learning**

Refer learners to page 101 of the Learner's Book for exercise.

**Suggested Home Work**

Doubles these numbers:

- (1) 6    (2) 8    (3) 0    (4) 9

For additional exercises on this module, refer to pages 58 - 59 of the Workbook

## Module 9: Addition and subtraction facts (fluency 2)

### Content Standard

**B2.1.2.3:** Develop and use strategies for mentally computing basic additions and subtraction facts to 19.

### Indicator

**B2.1.2.3.1:** Use mental strategies for basic addition facts to 19 and related subtraction facts to 19.

### Learning Expectation

Learners will be able to add combinations of numbers to make 10s quickly and accurately.

### Essentials for Learning

Learners can quickly add combinations of numbers to make 5.

### New words

combine, bonds, missing, total, pairs.

### Resources

Bottle cups, straws, number tree.

Number of Lessons **2**

## Lesson 1: Number bonds for 10

### Starter

Play "Making 5s". Say a number and learners add another number to make 5.

- 1)  $3 \rightarrow 2$       2)  $4 \rightarrow 1$       3)  $0 \rightarrow 5$

### Find Out

Refer to **Find out: A** on page 102 of the Learner's Book. Learners tell you the number of fingers shown and how many should be added to make 10. Fingers shown is 7. So  $7 + ? = 10$ .  $? = 3$ . So 3 has to be added to 7 to make 10.

**(Critical thinking, attention to precision, personal development)**

### Let us Learn

- Stand in front of the class. Pick a number of straws, e.g. 6 and show them to the class. Ask what number should be added to make 10. Learners say 4. Every learner picks 4 straws. One adds his/hers to yours to make 10. Therefore  $6 + 4 = 10$ .
- Repeat this activity using different materials such as bottle caps, books etc. **(Critical thinking, collaborative learning, attention to precision)**
- Play "making 10s" with learners. Hold up a number of fingers and learners quickly shout another number which when added to the fingers shown will add up to 10. E.g. 6 and learners shout 4; 9 and learners shout 1. **(Critical thinking, personal development)**

- Refer to **Let us learn: 1** on page 102 of the Learner's Book. Learners use the Number Rainbow to make 10. E.g. Learners take 6, trace 6 to the end which is 4, therefore  $6 + 4 = 10$ . **(Critical thinking, collaborative learning, attention to precision)**

### Review Exercise

### Differentiated Lessons

#### Low Ability Learners

- Working in pairs, learners add another number to make 10.
- 1) 6 and ?      2) 2 and ?  
3) 7 and ?      4) 4 and ?

#### High Ability Learners

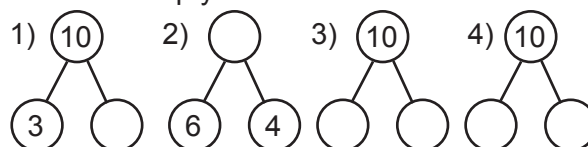
- Learners write 4 sets of two different numbers which add up to 10. They should work in pairs.

### Assessment for Learning

Refer learners to Exercise 1 on pages 104 of the Learner's Book.

### Suggested Home Work

Fill in the empty circles to make 10.



## Lesson 2: Number bonds for 15, 19, 20.

### Starter

'Play "Making 10s". Mention a number and learners add another number to make 10.  
E.g. (1)  $7 \rightarrow 3$  (2)  $5 \rightarrow 5$  (3)  $9 \rightarrow 1$

### Find out

Refer learners to **Find out: B** on page 102 of the Learner's Book. In pairs, learners brainstorm to find out the number to replace the question mark.  $16 + 4 = 20$ . Deduce from learners what must be added to 7 to make 20. The answer is 13. (*Critical thinking, collaborative learning, problem solving skills, attention to precision*).

### Let us Learn

- Write 20 on the board. Ask learners to work in groups of five. They should find 2 numbers which will add up to 20. Example. 10 and 10, 12 and 8, 16 and 4. Learners should find at least 5 sets of 2 different numbers which adds up to 20. (*Critical thinking, collaborative learning, problem solving skills, attention to precision*).
- Learners filling in the empty spaces to complete the number bonds for 19 and 15.

19		15	
0		5	
	6		6
12		11	
	10		12
8			

(*Critical thinking, collaborative learning, problem solving skills, attention to precision*)

- Refer learners to **Let us learn: 2** on page 103 of the Learner's Book. Take learners through the exercises.
- Number sentences could also be used to match number bonds, e.g.  
 $8 + 7 = 19$ ,  $18 + 2 = 20$ ,  $2 + 18 = 20$ ,  
 $20 - 15 = 5$ ,  $20 - 5 = 15$ .

### Review Exercise

### Differentiated Lessons

#### Low Ability Learners

Learners write 4 different number bonds for 15.

#### High Ability Learners

Learners write 3 different ways of writing number bonds for 19 and 20.

### Assessment for Learning

Refer learners to Exercise 2 on page 105 of the Learner's Book.

### Suggested Home Work

Fill in the empty boxes to complete these number bonds.

19	20	15																								
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For additional exercises on this module, refer to pages 60 - 61 of the Workbook.

**Module 10: Addition and subtraction facts (fluency 3)****Content Standard**

**B2.1.2.3:** Develop and use strategies for mentally computing basic additions and subtraction facts to 19.

**Indicator**

**B2.1.2.3.1:** Use mental strategies for basic addition facts to 19 and related subtraction facts to 19

**Learning Expectation**

Learners will be able to make 10s before adding other numbers.

**Essentials for Learning:**

Learners can find number bonds for 15 and 20.

**New words**

Double, add, subtract.

**Resources**

Bottle caps, straws.

Number of Lessons **3****Lesson 1: Addition (Making 10s to add)****Starter:**

Play counting forward and backwards (1 – 20). Clap at the same time

**Find Out:**

- Refer learners to page 106 of the Learner's Book. Learners discuss how they can answer the question. The total number is 20, the sum of the 2 known groups is 15. So, the question now is what must be added to 15 to make 20.  $15 + \boxed{\text{what}} = 20$ . Some learners may count on to get the answer. Accept any strategy that the learner may use.

**Let us Learn:**

- Write the question  $2 + 7 + 3 = ?$  on the board. In pairs, learners explain how they can solve this question easily. Let learners find out 2 numbers that add up to 10. That is 7 and 3 makes 10. Now they can count on to add 2 to get the answer 12 (**Critical thinking, collaborative learning**)
- Have learners work in groups of five. They make 10s first then add the next number.
  - (1)  $6 + 4 + 8 = ?$       (2)  $9 + 9 + 1 = ?$
  - (3)  $7 + 8 + 3 = ?$
 Learners compare their answers with other group members. Invite a group to come to the front and explain how they got their answer. (**Critical thinking, collaborative learning, personal development, attention to precision**)

- Refer to **Let us learn: 1** on page 106 of the Learners Book. Have learners solve  $6 + 4 + 3 = \boxed{\phantom{00}}$ . They make 10 first.  $10 + 3 = 13$ . They count on to get the answer.

**Review exercise****Differentiated Lessons****Low Ability Learners**

- Learners work in pairs to solve the following:
  - (1)  $2 + 6 + 8 = ?$       (2)  $7 + 5 + 5 = ?$

**High Ability Learners**

- Learners work in pairs to solve the following.
  - (1)  $9 + 6 + 0 =$       (2)  $6 + 7 + 4 =$
  - (3)  $6 + 7 + 3 =$

**Assessment for Learning**

Refer learners to Exercise 1 on page 108 of the Learner's Book.

**Suggested Home Work**

Add the following. Make 10s first.

- (1)  $0 + 9 + 1 =$       (2)  $2 + 6 + 8 =$
- (3)  $4 + 9 + 6 =$

**Lesson 2: Addition (making doubles “+” to add)****Starter**

Play “Making 10s”. Mention a number and ask learners to say a number which adds up to 10.

- E.g. (1)  $0 \rightarrow 10$       (2)  $2 \rightarrow 8$   
 (3)  $6 \rightarrow 4$       (4)  $1 \rightarrow 9$

**Let us Learn**

- Write  $6 + 8 = ?$  on the board. Demonstrate and explain how to make doubles out of it and to add on. Now, let learners decompose 8 as 6 and 2. The question will now read  $6 + 6 + 2$ . Double of 6 is 12 and  $12 + 2 = 14$ .
- Put learners into groups of 5. Write the addition sentence on the board  $7 + 5 = ?$ . Make doubles first and add. This could be rewritten as  $5 + 5 + 2 = 12$ . Let learners know that, when making doubles, they must use the smaller number. (**Critical thinking, collaborative learning attention to precision**)
- Working in pairs learners solve the following.
  - $6 + 7 = ?$
  - $9 + 8 = ?$
  - $11 + 10 = ?$

Refer to **Let us learn: 2** on page 107 of the Learner's Book. Have learners solve  $5 + 6 = \square$

**Review Exercise****Low Ability Learners**

- Learners work in pairs using doubles strategy.
- (1)  $12 + 10 = ?$    (2)  $9 + 8 = ?$    (3)  $7 + 4 = ?$

**High Ability Learners**

- Work in pairs. Use doubles strategy.
- (1)  $15 + 20 = ?$    (2)  $17 + 24 = ?$

**Assessment for Learning**

Refer learners to Exercise 2 on page 109 of the Learner's Book.

**Suggested Home Work**

Solve these using the doubles strategy.

- (1)  $7 + 9 = ?$    (2)  $8 + 9 = ?$   
 (3)  $10 + 19 = ?$    (4)  $12 + 7 = ?$

## Lesson 3: Addition (Making doubles '−' to add)

**Starter**

Play "Making doubles".

Mention a number and learners double the number and say it out loud.

- 1  $4 \rightarrow 8$    2  $3 \rightarrow 6$

- 3  $1 \rightarrow 2$    4  $5 \rightarrow 10$

**Let us Learn**

- Write  $5 + 6 = ?$  on the board. Explain to learners that instead of  $5 + 6 = ?$  we can write  $5 + 5 + 1 = 11$  or  $6 + 6 - 1 = 12 - 1 = 11$  (1 is subtracted because we added 1 more).
- Put learners into groups of five. Write some questions for learners to use doubles to add. Use + and − to find the answers. E.g.  $7 + 8 = ?$  by adding, it becomes  $7 + 7 + 1 = 15$ . By subtracting, it becomes  $8 + 8 - 1 = 15$
- Repeat this with different questions. Have learners go round and compare their answers with others.
- Refer to **Let us learn 3** on page 107 of the Learner's Book. Go through the exercise with learners.

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

Learners work in pairs. They use doubles "+" or "-" to solve the following.

- 1)  $9 + 10 = ?$   
 2)  $7 + 6 = ?$

**High Ability Learners**

Working in pairs, learners write 2 addition sentences on their own. They use doubles "+" or "-" to solve.

**Assessment for Learning**

Refer to Exercise 3 on page 110 of the Learner's Book.

**Suggested Home work.**

Use doubles to solve the following:

- 1  $10 + 11$   
 2  $7 + 9$   
 3  $8 + 9$   
 4  $11 + 12$

For additional exercises on this module, refer to pages 62 - 64 of the Workbook.

**Module 11:** Subtraction strategies**Content Standard**

**B2.1.2.3:** Develop and use strategies for mentally computing basic addition and subtraction facts to 19

**Indicator**

**B2.1.2.3.1:** Use mental strategies for basic addition facts to 19 and related subtraction facts to 19

**Learning Expectation**

Learners will be able to use count down/back to do subtraction.

**Essentials for Learning**

Learners can count backwards from 20 to 1.

**New Words**

Count back subtract.

**Resources**

Number line cards, 100 number chart.

Number of Lessons **2****Lesson 1:** Subtraction (counting down)**Starter**

Have learners count backwards from 20 to 1 while clapping at the same time.

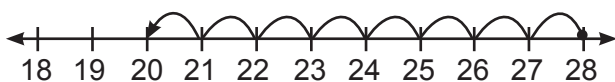
**Find Out**

Refer learners to page 111 of the Learner's Book. Have learners discuss how they would solve the problem  $38 - 5 = ?$ . Some learners may use the decomposition strategy, others could use counting back. Accept all  $38 = 30 + 8 - 5 = 33$ . Have learners work in pairs.

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

**Let Us Learn**

- Learners work in pairs. Write  $25 - 8 = ?$  on the board. Demonstrate by explaining the steps.
- Have learners count back 8 steps to get the answer: 25, 24, 23, 22, 21, 20, 19, 18, 17 so  $25 - 8 = 17$ .



- (Critical thinking, collaborative learning, attention to precision)**
- Let learners know that the number line could also be used. Give number line cards to learners in pairs. They start on 25 and count back 8 times. So,  $25 - 8 = 17$ .  
**(Critical thinking, collaborative learning, attention to precision)**

- Refer learners to **Let us learn: 1** on page 111 of the Learner's Book. Go through the steps with learners to solve the problem  $45 - 4 = ?$ . Learners start at the bigger number and count back 4 steps to get the answer. Let them use the number line cards as well.

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

Working in pairs, learners use count down to solve the following problems:

- 1)  $38 - 7 = ?$       2)  $18 - 9 = ?$

**High Ability Learners**

Working in pairs, solve the following problems using count down.

- (1)  $68 - 9 = ?$     (2)  $37 - 8 = ?$     (3)  $55 - 7 = ?$

**Assessment for Learning**

Refer learners to Exercise 1 on page 113 of the Learner's Book.

**Suggested Home Work**

Use count down to solve the following problems:

- (1)  $92 - 9 = ?$                       (2)       $66 - 11 = ?$   
(3)  $32 - 9 = ?$                       (4)       $50 - 6 = ?$



## Lesson 2: Changing subtraction sentence into addition sentence

### Starter

Have learners count backwards from 20 to 1 while clapping at the same time.

### Let Us Learn

- Write this subtraction sentence on the board:  $15 - 7 = ?$  Learners work in groups of five. Let learners explain what the sentence means in their groups. They should change it into an addition sentence and solve it.  $15 - 7 = ?$  means  $15 - 7 =$  what. Have learners change it into addition sentence as  $7 + \text{what} = 15$ . What must be added to 7 to get 15?  $7 + 8 = 15$  so  $15 - 7 = 8$ . (**Critical thinking collaborative learning, attention to precision**)
- Refer to **Let us learn: 2** on page 112 of the Learner's Book.  
 $24 - 6 = \rightarrow 6 + ? = 24$   
 $6 + ? = 24$   
 $6 + 10 = 16$  (Add 10 to 6 to get 16)  
 $16 + 4 = 20$  (Add 4 to 16 to get 20)  
 $20 + 4 = 24$  (Add 4 to 20 to get 24)
- The answer is the sum of what you added in bits.
- That is,  $10 + 4 + 4 = 18$ , so  $24 - 6 = 18$ .  
**(Critical thinking, collaborative learning)**

### Review Exercise

#### Differentiated Lessons

##### Low Ability Learners

- Working in pairs, learners change the subtraction sentences into addition sentences and solve them.  
 (1)  $18 - 9 = ?$       (2)  $20 - 15 = ?$

##### High Ability Learners

- Work in pairs. Change into addition sentences and solve them.  
 (1)  $26 - 12 = ?$       (2)  $65 - 13 = ?$   
 (3)  $48 - 29 = ?$

#### Assessment for Learning

Refer learners to page 114 of the Learner's Book for exercise.

#### Suggested Home Work

Change these into subtraction sentences and solve them.

- (1)  $31 - 9 = ?$       (2)  $42 - 19 = ?$   
 (3)  $60 - 25 = ?$   
 (4)  $92 - 45 = ?$

For additional exercises on this module, refer to pages 65 - 66 of the Workbook.

**Module 12:** Addition of whole numbers (sum up to 100)**Content Standard**

**B2.1.2.4:** Develop and use conventional and personal strategies for computing additions up to 100

**Indicator**

**B2.1.2.4.1:** Use conventional strategy to add and subtract within 100

**Learning Expectation**

Learners will be able to do addition with sum up to 100 without regrouping.

**Essentials for Learning**

Learners can do addition with sum up to 20.

**New Words**

Group, regroup, tens, ones, add, decompose.

**Resources**

Bundles of sticks in tens, addition frame chart, 100 number chart.

Number of Lessons **2****Lesson 1:** Addition without regrouping**Starter**

Play "Add 1 more". Mention a number and learners add 1 more and say it.

Example: 1 0 → 1                  2 17 → 18  
3 29 → 30

**Find Out**

Refer to Learners Book page 115 of the Learner's Book. Learners count and find out the number of sticks, i.e. 37. Deduce from learners how they got the answer. Learners know how to count by 5s already. So they can identify that there are 6 groups of 5s which is 30, plus 7 single ones, making 37. **(Collaborative learning, critical thinking, attention to precision)**

**Let us Learn**

- Write an addition sentence on the board  $25 + 4 = ?$ . Explain to learners that to add a single number to a 2-digit number, we start on the bigger number and count on. so,  $25 + 4 = ?$ . When we count on 4 times from 25, i.e. 26, 27, 28, 29, we get 29. So  $25 + 4 = 29$ .
- Give more examples for learners to practise.
 

(1)  $32 + 6 = ?$       (2)  $58 + 9 = ?$   
(3)  $52 + 7 = ?$
- To solve  $32 + 6 = ?$  start on 32 and count on 6 times to get your answer. So,  $32 + 6 = 38$ . **(Critical thinking, collaborative learning, attention to precision)**

- Refer to **Let us learn: 1a** and **1b** on pages 115 and 116 of the Learner's Book. Go through the question  $82 + 4 = ?$  with learners. They use the count on strategy, using fingers or the number line to solve it.

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

- Work in pairs to solve the following. Use count on strategy.
 

(1)  $26 + 3 = ?$       (2)  $44 + 4 = ?$

**High Ability Learners**

Solve these. Use count on strategy.

- (1)  $81 + 8 = ?$       (2)  $62 + 7 = ?$   
(3)  $30 + 7 = ?$

**Assessment for Learning**

Refer learners to Exercise 1 on page 119 of the Learner's Book.

**Suggested Home Work**

Solve these. Use count on strategy.

- (1)  $31 + 6 = ?$       (2)  $40 + 9 = ?$   
(3)  $81 + 7 = ?$       (4)  $21 + 8 = ?$

**Lesson 2:** Addition with regrouping**Starter**

Play '1 more'

Mention a number and learners add 1 more to that number.

Example: (1)  $7 \rightarrow 8$       (2)  $93 \rightarrow 94$

(3)  $81 \rightarrow 82$       (4)  $66 \rightarrow 67$

**Let Us Learn**

- Put learners into groups of five. Write an addition sentence on the board. Demonstrate and explain step by step how to solve it. Example  $28 + 6 = ?$ .

1) Decompose 28 as  $20 + 8$

$$28 + 8 = 20 + 8 + 6$$

$$20 + 8 + 6 = ?$$

$$20 + 14 \text{ (decompose 14 as } 10 + 4)$$

$$20 + 10 + 4 = 34$$

$20 + 10 + 4 = 34$  (Add to get your answer)

So  $28 + 6 = 34$ . (**Attention to precision, critical thinking, collaborative learning**)

2) Using Addition Frame

T	O
2	8
+	6

$$2 \quad 14 \rightarrow (10 + 4)$$

$$2 + 1 \quad + 4$$

$$3 \quad + 4 = 34$$

$$\text{so } 28 + 6 = 34$$

(**Critical thinking, collaborative learning, attention to precision**)

- Give more exercises for learners to work in pairs.

(1)  $38 + 9$       (2)  $67 + 6$

- Refer learners to **Let us learn: 2a, 2b** and **2c** on pages 117 and 118 of the Learner's Book. Go through the exercises with learners. Have learners use the addition frame and the decomposition strategy to solve the question.

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

- Working in pairs, learners use the decomposition strategy to solve the problems.

(1)  $24 + 6$       (2)  $56 + 8$

**High Ability Learners**

- Working in pairs, learners use the addition frame to solve the problems.

1)  $38 + 9$       2)  $67 + 7$       3)  $88 + 6$

**Assessment for Learning**

Refer learners to Exercise 2 on pages 119 and 120 of the Learner's Book.

**Suggested Home Work**

Use decomposition strategies and addition frame to solve the following:

(1)  $69 + 4 =$       (2)  $34 + 8 =$       (3)  $88 + 6 =$

For additional exercises on this module, refer to pages 67 - 69 of the Workbook.

**Module 13:** Subtraction of whole numbers (within 100)**Content Standard**

**B2.1.2.4:** Develop and use conventional and personal strategies for computing additions up to 100.

**Indicator**

**B2.1.2.4.1:** Use a conventional strategy to add and subtract within 100.

**Learning Expectation**

Learners will be able to do subtraction of whole numbers with or without regrouping within 100.

**Essentials for Learning**

Learners can do addition without regrouping with sum up to 100.

**New words**

Decompose, subtract, group, regroup, tens, ones.

**Resources**

Addition frame, number line cards.

Number of Lessons **2****Lesson 1:** Subtraction without regrouping**Starter**

Play "1 less than". Call out a number.

Learners say a number that is 1 less than the number. (1)  $30 \rightarrow 29$  (2)  $66 \rightarrow 65$   
(3)  $14 \rightarrow 13$  (4)  $23 \rightarrow 22$

**Find Out**

Refer learners to page 121 of the Learner's Book. In pairs learners look at the picture of the eggs. They should identify the number of broken eggs and the total number of eggs. They write subtraction sentence for it. They should come up with  $35 - 7 = ?$  and solve it.

**Let Us Learn**

- Put learners into groups of five. Write the subtraction sentence  $25 - 4$  on the board. Learners use the decomposition strategy to solve it.

$$\begin{array}{r} 25 - 4 = ? \\ \swarrow \quad \searrow \\ 20 + 5 - 4 \\ 20 + 1 \\ = 21 \end{array}$$

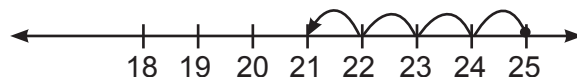
So  $25 - 4 = 21$

Using a place value frame:

T	O
2	5
-	4
2	1

So  $25 - 4 = 21$

- The number line could also be used to solve the problem. Start on the bigger number and count back 4 steps for the answer. (**Critical thinking, collaborative learning, attention to precision**)



So,  $25 - 4 = 21$ .

- Have learners practise solving these in their groups.  
1)  $36 - 4 = ?$     2)  $55 - 3 = ?$   
3)  $87 - 6 = ?$   
(**Critical thinking, collaborative learning**)
- Refer learners to **Let us learn: 1** on page 121 of the Learner's Book. Go through with learners to solve  $58 - 4$ . Learners decompose 58 as  $50 + 8$  and subtract 4 from 8 to get 54. Learners again use the place value and the number line card to solve the same question.

**Review Exercise**

Work in pairs. Use the number line and the decomposition strategy to solve these exercises.

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

- 1)  $28 - 6 = ?$     2)  $37 - 6 = ?$

**High Ability Learners**

- 1)  $57 - 6 = ?$     2)  $55 - 3 = ?$     3)  $88 - 7 = ?$

### Assessment for Learning

Refer learners to Exercise 1 on page 123 of the Learner's Book.

### Suggested Home Work

Solve these:

- 1)  $36 - 5 = ?$       2)  $48 - 8 = ?$   
3)  $79 - 6 = ?$       4)  $57 - 6 = ?$

## Lesson 2: Subtraction with Regrouping

### Starter

Play "1 less than". Say a number. Learners say a number that is 1 less than the number:

- 1)  $30 \rightarrow 29$       2)  $66 \rightarrow 65$   
3)  $14 \rightarrow 13$       4)  $23 \rightarrow 22$

### Let Us Learn

- Write the subtraction sentence  $43 - 7 = ?$  on the board for learners to solve in pairs. Decompose the number by explaining the process step by step to learners, using the decomposition strategy and place value chart.  
 $43 - 7$ : Decompose 43 as  $40 + 3$  and 7 as  $4 + 3$ .  
 $40 + 3 - 3 = 40$ ,  $40 - 4 = 36$   
**(Attention to precision, critical thinking, collaborative learning)**
- Using the place value chart.

T	O
4	3
-	7
3	13
	7
3	6

Change 1 ten as 10 ones and add to 3 to make 13.

The number line could also be used.



- Start at the minuend and count back 7 spaces to land at 36, therefore  $43 - 7 = 36$ .  
**(critical thinking, collaborative learning, attention to precision)**
- Refer to **Let us learn: 2** on page 122 of the Learner's Book. Go through the exercise with learners using the decomposition strategy, the place value chart or the number line.

### Review Exercise

### Differentiated Lessons

#### Low Ability Learners

- Working in pairs, learners solve these:  
1)  $26 - 5 = ?$       2)  $35 - 6 = ?$

#### High Ability Learners

- Working in pairs, learners solve these:  
1)  $36 - 9 = ?$       2)  $52 - 7 = ?$       3)  $82 - 7 = ?$

### Assessment for Learning

Refer learners to Exercise 2 on page 123 of the Learners Book.

### Suggested Home Work

Use any strategy to solve these:

- 1)  $64 - 7 = ?$       2)  $70 - 4 = ?$   
3)  $51 - 7 = ?$       4)  $82 - 9 = ?$

For additional exercises on this module, refer to pages 70 - 72 of the Workbook.

**Module 14:** Personal strategies for addition (1)**Content Standard**

**B2.1.2.4:** Develop and use conventional and personal strategies for computing additions up to 100.

**Indicator**

**B2.1.2.4.2:** Use personal strategies to add and subtract within 100.

**Learning Expectation**

Learners will be able to decompose numbers for easy addition.

**Essentials for Learning**

Learners can add two numbers with sum up to 20.

**New words**

Decompose, friendly jumps, break.

**Resources**

Straws, bottle caps.

Number of Lessons **2****Lesson 1:** Addition using the decomposition strategy**Starter**

Play "Making 10s": Say a number, learners find another number that adds up to 10 and say it out loud.

Eg. 1)  $2 \rightarrow 8$    2)  $4 \rightarrow 6$    3)  $7 \rightarrow 3$    4)  $1 \rightarrow 9$

**Find Out**

Refer learners to the Learner's Book on page 124. Have learners talk about how they can decompose 45 in different ways. Expected answers:  $20 + 25$ ,  $30 + 15$ ,  $40 + 5$ . 33 could be decomposed as  $30 + 3$ ,  $20 + 13$ . Now, to add 45 to 35, could easily be done as  $40 + 5 + 30 + 3$ .

$(40 + 30) + (5 + 3)$

$70 + 8 = 78$  so  $45 + 33 = 78$

**(Critical thinking, collaborative learning, attention to precision)**

**Let us Learn 1**

- Put Learners into convenient groups. Write these numerals on the board for learners to decompose:

1)  $\begin{array}{c} 66 \\ \swarrow \downarrow \\ 60 + 6 \end{array}$    2)  $\begin{array}{c} 87 \\ \swarrow \downarrow \searrow \\ 20 + 60 + 7 \end{array}$    3)  $\begin{array}{c} 66 \\ \swarrow \downarrow \searrow \\ 40 + 20 + 6 \end{array}$

- Learners use the decomposition strategy to add.  $39 + 35$

$\begin{array}{c} 39 \\ \swarrow \searrow \\ 30 + 9 \end{array}$     $\begin{array}{c} 35 \\ \swarrow \searrow \\ 30 + 5 \end{array}$

$30 + 30 + 9 + 5 = 74$

$60 + 10 + 4 = 74$

$60 + 10 + 4 = 74$

- Repeat this exercise with different numbers. Have learners work in pairs. **(Critical thinking, collaborative learning)**
- Refer learners to page 124 of the Learner's Book. Go through **Let us learn: 1** with learners  $36 + 25$  and  $43 + 39$ .

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

- Use the decomposition strategy to add. Work in pairs
- 1)  $28 + 31 = ?$    2)  $42 + 37 = ?$

**High Ability Learners**

- Working in pairs use the decomposition strategy to solve these addition sentences.
- 1)  $64 + 44 = ?$    2)  $33 + 55 = ?$

**Assessment for Learning**

Refer learners to Exercise 1 on page 126 of the Learner's Book.

**Suggested Home Work**

Use the decomposition strategy to solve these addition sentences.

- 1)  $52 + 37$    2)  $26 + 44$   
3)  $13 + 66$    4)  $54 + 34$

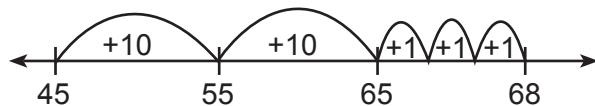


**Lesson 2:** Addition using friendly jumps**Starter**

Learners clap and count 1 – 20 forward and backwards.

**Let us Learn**

- Put learners into groups of five. Draw a number line on the board. Write the addition sentence  $45 + 23$  on the board.  $45 + 23 = ?$



- Have learners decompose 23 as  $10 + 10 + 3$ . Now, starting at 45, make 2 jumps of 10 and then 3 jumps of 1 so  $45 + 23 = 68$ . (**Critical thinking, collaborative learning, attention to precision**)
- Give addition sentences to each group. They decompose one of the numbers and use friendly jumps to add.  
1)  $46 + 33$       2)  $62 + 37$       3)  $53 + 27$
- Learners move round to compare how other learners decomposed their numbers. They correct themselves where they made mistakes. (**Critical thinking, collaborative learning, attention To precision**)

- Refer to **Let us learn: 1** on page 125 of the Learner's Book. Go through the question  $62 + 25 = \square$  with learners. Take them through the steps.

**Assessment for Learning**

Refer learners to Exercise 2 on page 127 of the Learner's Book.

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

- Decompose one of the numbers and use friendly jumps to find the answers.  
1)  $26 + 31$       2)  $42 + 37$

**High Ability Learners**

- Solve these. Use decomposition strategy and friendly jumps.  
1)  $48 + 37$       2)  $66 + 33$       3)  $28 + 76$

**Suggested Home Work**

Add these numbers. Use friendly jumps and decomposition strategies.

- 1)  $42 + 17$       2)  $56 + 32$   
3)  $26 + 44$       4)  $65 + 36$

For additional exercises on this module, refer to pages 73 - 75 of the Workbook.

**Module 15:** Personal strategies for addition (2)**Content Standard**

**B2.1.2.4** Develop and use conventional and personal strategies for computing additions up to 100.

**Indicator**

**B2.1.2.4.2** Use personal strategies to add and subtract within 100.

**Learning Expectation**

Learners will be able to do addition using the “moving part” strategy.

**Essentials for Learning**

Learners can do addition and subtraction using the decomposition strategy.

**New Words**

Little bit, take away

**Resources**

Bottles caps, straws

Number of Lessons **2****Lesson 1:** Addition using the moving part strategy**Starter:**

Play “Making 10s”. Call out a number and learners find another number to make 10.

e.g. 1)  $6 \rightarrow 4$     2)  $7 \rightarrow 3$     3)  $0 \rightarrow 10$   
4)  $10 \rightarrow 0$

**Find Out**

Refer learners to the Learner's Book on page 128. Have learners work in pairs. They explain the strategy they used to get the answers.

**(Critical thinking, collaborative learning)**

**Let Us Learn**

- Have learners work in groups of five. Write  $49 + 15$  on the board. Demonstrate how to use the “moving part” strategy to solve it. Move 1 from 15 and add it to 49 to make 50. Decompose 14 as  $10 + 4$ . So, the expression now becomes  $50 + 10 + 4 = 64$ . **(critical thinking, collaborative learning)**
- Give the numeral card  $38 + 26 = ?$  to each group.
- Learners move 2 from 26, and add it to 38 to make 40. Decompose 24 as  $20 + 4$  so the expression now becomes  $40 + 20 + 4 = 64$ . So  $38 + 26 = 64$ .
- Refer learners to page to **Let us learn: 1** on page 128 of the Learner's Book. Go through the exercise with them.

- Have learners solve  $39 + 47$ .  
 $39 + 47$   
 $= 40 + 46$  (move 1 from 46, add it to 39)  
 (decompose 46 as  $20 + 20 + 6$ )  
 $= 40 + 20 + 20 + 6 = 86$   
 So  $39 + 47 = 86$ .

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

- Use the “moving parts” strategy to solve these:  
 1)  $28 + 15 = ?$     2)  $39 + 8 = ?$

**High Ability Learners**

- Solve these in pairs. Use the “moving parts” strategy.
- 1)  $68 + 27 = ?$     2)  $55 + 47 = ?$

**Assessment for Learning**

Refer learners to Exercise 1 on page 129 of the Learner's Book.

**Suggested Home Work**

Use the “moving parts” strategy to solve these:

- 1)  $27 + 13 = ?$     2)  $58 + 36 = ?$   
 3)  $53 + 49 = ?$     4)  $76 + 28 = ?$

**Lesson 2:** Addition using  
“compensation strategy”**Starter**

Play “2 more than”. Call out a number.

Learners add 2 to it and call out the answer.

- 1)  $6 \rightarrow 8$       2)  $27 \rightarrow 29$   
3)  $68 \rightarrow 70$     4)  $88 \rightarrow 90$

**Let Us Learn**

- Write  $28 + 19 = ?$  on the board.
- Explain to learners that to make the addition friendly, we are going to add a little bit to the 2 numbers.  $28 + 19 = ?$   
We add 2 to 28 to get 30, then add 1 to 19 to get 20. The addition sentence now becomes  $30 + 20 = 50$  we then subtract 3 from the answer (little bits that we added) i.e.  $3 (2 + 1)$ :  $50 - 3 = 47$ . So  $28 + 19 = 47$
- Have learners work these out in their groups.  
1)  $38 + 17 = ?$       2)  $58 + 17 = ?$
- Refer learners to **Let us learn: 2** on page 129 of the Learner’s Book. Go through the exercise with them.  $59 + 37 = ?$ . Learners add 1 to 59 to get 60 and 3 to 37 to get 40. The addition sentence now becomes  $60 + 40 = 100 - 4$  (the 1 and 3 that were added)  
 $100 - 4 = 96$   
So  $59 + 37 = 96$

**Review Exercise**

Use the compensation strategy to solve these number sentences.

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

- 1)  $29 + 18 = ?$       2)  $48 + 19 = ?$

**High Ability Learners**

- 1)  $68 + 28 = ?$     2)  $38 + 37 = ?$   
3)  $17 + 64 = ?$

**Assessment for Learning**

Refer learners to Exercise 2 on page 130 of the Learner’s Book.

**Suggested Home Work**

Use the compensation strategy to solve these addition sentences.

- 1)  $18 + 26 = ?$       2)  $39 + 28 = ?$   
3)  $66 + 17 = ?$       4)  $77 + 43 = ?$

For additional exercises on this module, refer to pages 76 - 78 of the Workbook.

**Module 16:** Personal strategies for subtraction (1)**Content Standard**

**B2.1.2.4:** Develop and use conventional and personal strategies for computing additions up to 100

**Indicator**

**B2.1.2.4.2:** Use personal strategies to add and subtract within 100

**Learning Expectation**

Learners will be able to use counting down/back strategies to solve subtraction sentences within 100.

**Essentials for Learning**

Learners can do addition of two -2digit numbers using compensation strategy.

**New words**

Count on, increment, decompose, minus, split.

**Resources**

Number line cards, straws, addition sentence cards.

Number of Lessons **3****Lesson 1:** Subtraction “using counting on”**Starter**

Play “Making doubles”. Call out a number between 1 and 5 and learners double it.

1)  $3 \rightarrow 6$     2)  $4 \rightarrow 8$     3)  $1 \rightarrow 2$

**Find Out**

Refer to the Learner's Book page 131. Deduce from learners how they would solve the subtraction sentence.  $38 - 16 = ?$

**Let Us Learn**

- Put learners into groups of 6. Write the following subtraction sentence  $18 - 5 = ?$  on the board. They should use counting back to solve it. Learners count 5 steps back. i.e. 17, 16, 15, 14, 13. The answer is 13. (**Collaborative learning, personal development**)

Number lines could also be used for counting back.  $25 - 8$



- Move backwards 8 spaces and you land on 17. So,  $25 - 8 = 17$ . (**Critical thinking, collaborative learning**)
- Refer to **Let us learn: 1** on page 131 of the Learner's Book. Go through the questions with learners.

$$43 - 19 = ?$$

- Learners change the subtraction sentence to an addition sentence as  $19 + ? = 43$ . Learners use the counting on strategy to solve it.

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

Work in pairs.

Use the counting back strategy to solve these.

1)  $28 - 9 = ?$

2)  $16 - 8 = ?$

**High Ability Learners**

- Work in pairs.

Use the counting back strategy to solve these.

1)  $25 - 7 = ?$

2)  $34 - 12 = ?$

3)  $41 - 14 = ?$

**Assessment for Learning**

Refer learners to Exercise 1 on page 133 of the Learner's Book.

**Suggested Home Work**

Solve using the counting back strategy.

1)  $79 - 8 = ?$

2)  $34 - 17 = ?$

3)  $52 - 35 = ?$

**Lesson 2:** Subtraction (using the incrementing strategy)**Starter**

Play "Making doubles". Call out a number between 1 and 5 and have learners double it.  
E.g. 1)  $2 \rightarrow 4$  2)  $5 \rightarrow 10$  3)  $10 \rightarrow 20$

**Let Us Learn**

- Put learners into groups of five. Write this sentence on the board:  $25 - 13 = ?$
- Learners find friendly numbers for 13 (10, 3).  
 $25 - 10 = 15$  (subtract 10)  
 $15 - 3 = 12$  (subtract 3)  
So  $25 - 13 = 12$  (**Critical thinking, collaborative learning**)
- Give learners subtraction sentence cards. They use the same strategy to solve them. They should work in pairs.

1)  $38 - 17 = ?$

2)  $52 - 31 = ?$

- Learners move round and compare their answers with their friends. Learners make corrections where necessary. (**Critical thinking, collaborative learning**)
- Refer learners to **Let us learn: 2** on page 132 of the Learner's Book. Go through the questions with them.  
 $43 - 19 = ?$   
 $43 - 10 = 33$  (subtract 10)  
Decompose 9 as 3 and 6  
 $33 - 3 = 30$  (subtract 3)  
 $30 - 6 = 24$  (subtract 6)  
So  $43 - 19 = 24$

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

Give learners subtraction sentence cards. They should use the incrementing strategy to solve them.

1)  $28 - 15 = ?$

2)  $36 - 8 = ?$

**High Ability Learners**

Use the incrementing strategy to solve these.

1)  $56 - 24 = ?$

2)  $49 - 35 = ?$

**Assessment for Learning**

Refer learners to Exercise 2 on page 133 of the Learner's Book.

**Lesson 3:** Subtraction (using the decomposition strategy)**Starter**

Play "1 less". Mention a number and learners give an answer which is 1 less than the number mentioned.

E.g. 1)  $13 \rightarrow 12$  2)  $25 \rightarrow 24$  3)  $16 \rightarrow 15$

**Let Us learn**

- Put learners into groups of five.  
Write a subtraction sentence on the board.  
 $46 - 24 = ?$  Explain the procedure gradually to learners. Decompose 46 as  $40 + 6$  and 24 as  $20 + 4$ . So  $46 - 24$  becomes  
 $(40 + 6) - (20 + 4)$   
 $= (40 - 20) + (6 - 4)$   
 $= 20 + 2 = 22$
- Have learners solve these in pairs.  
1)  $56 - 33 = ?$  2)  $46 - 22 = ?$
- Learners move to other groups and compare the methods used, their answers and correct themselves if they got it wrong.
- Refer to **Let us learn: 3** on page 132 of the Learner's Book. Go through the questions with learners.  
 $43 - 19 = ?$ . Decompose 19 as 10 and 9.  
 $43 - 10 = 33$   
 $33 - 9 = ?$  (Decompose 9 as 3 and 6)  
 $33 - 3 = 30$ ,  $30 - 6 = 24$   
So  $43 - 19 = 24$   
(**Critical thinking, collaborative learning**)

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

Work in pairs, use the decomposition strategy to solve the following:

1)  $38 - 15 = ?$

2)  $24 - 11 = ?$

**High Ability Learners**

Work in pairs. Use decomposition strategy to solve the following:

- 1)  $42 - 18 = ?$
- 2)  $63 - 21 = ?$

**Assessment for Learning**

Refer learners to Exercise 3 on page 133 of the Learner's Book.

**Suggested Home Work**

Decompose one number to solve these.

- 1)  $76 - 24 = ?$
- 2)  $54 + 25 = ?$
- 3)  $38 - 29 = ?$

For additional exercises on this module, refer to pages 79 - 81 of the Workbook.



**Module 17:** Personal strategies for subtraction (2)**Content Standard**

**B2.1.2.4:** Develop and use conventional and personal strategies for computing additions up to 100

**Indicator**

**B2.1.2.4.2:** Use personal strategies to add and subtract within 100

**Learning Expectation**

Learners will be able to do subtraction using compensation strategy.

**Essentials for Learning**

Learners can use compensation strategy to solve addition sentences.

**New Words**

Compensate, add, constant, difference, friendly, jumps, subtract.

**Resources**

Straws, bottle caps, number line cards.

Number of Lessons **3**

**Lesson 1:** Subtraction (using compensation)**Starter**

Play "1 less than". Say a number and learners subtract 1 from it, e.g.

- 1)  $16 \rightarrow 15$    2)  $10 \rightarrow 9$    3)  $7 \rightarrow 6$   
4)  $50 \rightarrow 49$

**Find Out**

Refer learners to page 134 of the Learner's Book. Elicit from learners how they will solve the subtraction problem.

How many chocolates are there? How many have been eaten? Deduce from learners how they will write a subtraction sentence for the problem. Expected answer:  $9 - 2 = 7$ . There will be different ways of solving this subtraction question. Accept them if only they are correct.

**Let Us Learn**

- Put learners into groups of five. Write a subtraction sentence on the board.
- Demonstrate by explaining how the subtraction sentence could be solved easily. Example  $53 - 19 = ?$ . Add 1 to 19 to make 20. Now the subtraction sentence becomes  $53 - 20 = ?$ . This is easier to subtract and gives the answer as 33. The answer has to be adjusted because we subtracted 1 more than was expected. So we have to add the 1 to the answer. Therefore,  $53 - 19 = 33 + 1 = 34$ .
- Have learners practise more in their groups and in pairs to solve the following

questions. Have them compare their answers and talk about how they solved them.

- 1)  $25 - 19 = ?$   
2)  $46 - 29 = ?$   
3)  $67 - 38 = ?$

**(Critical thinking, collaborative learning, problem solving skills)**

- Write  $60 - 41 = ?$  on the board for learners to solve. They should work in their groups. Explain that we shall subtract 1 from 41 to get 40. Our subtraction sentence now becomes  $60 - 40 = 20$ , which is very easy to subtract. We subtracted 1 less than we should have done (instead of subtract 41, we subtracted 40). So, we have to subtract 1 from the answer. So  $20 - 1 = 19$ . Give more examples for learners to solve.  
1)  $70 - 41 = ?$   
2)  $66 - 32 = ?$

**(Critical thinking, collaborative learning, problem solving skills)**

- Refer to **Let us learn: 1** on page 134 of the Learner's Book. Go through the question  $95 - 57 = ?$  with learners. Use both methods by adding and subtracting.

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

- Have learners work in pairs to solve these.  
1)  $35 - 19 = ?$   
2)  $32 - 18 = ?$

**High Ability Learners**

- Have learners work in pairs and solve these. (They should use compensation by adding and subtracting.)
  - $85 - 58 = ?$
  - $76 - 29 = ?$

**Assessment for Learning**

Refer learners to Exercise 1 on page 137 of the Learner's Book.

**Suggested Home Work**

Subtract, use compensation strategy.

- $47 - 21 = ?$
- $76 - 58 = ?$
- $62 - 28 = ?$
- $88 - 39 = ?$

**Note:**

**Compensation strategy:** Adding or subtracting and then adjusting the answer works better when the number to be added or subtracted is slightly less or slightly more than multiples of 10 respectively. Make sure they understand adding before you introduce subtracting.

**Lesson 2: Subtraction (using friendly jumps)****Starter**

Play "2 less than" Mention a number and learners say a number which is 2 less.

Example:

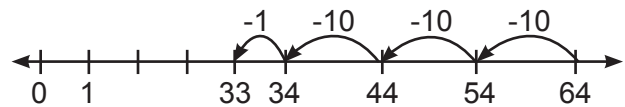
- $7 \rightarrow 5$
- $2 \rightarrow 0$
- $15 \rightarrow 13$
- $20 \rightarrow 18$

**Let us Learn**

- Put learners into groups of five. Write this sentence on the board.  $64 - 33 = ?$
- Demonstrate by explaining and taking these steps for learners to understand.
  - Decompose 33 with learners as  $(10 + 10 + 10 + 3)$
  - Subtract 10 three times from 64.  $(64 - 10 = 54 - 10 = 44 - 10 = 34)$

3) Now subtract 3 from 34, so  $64 - 33 = 31$

- The number line could also be used to do the subtraction below.  
 $64 - 33 = ?$



- To get the answer count the number of jumps and add.  
That is  $10 + 10 + 10 + 1 = 31$   
So  $64 - 33 = 31$
- Give more examples for learners to work in pairs.
  - $37 - 25 = ?$
  - $63 - 35 = ?$
- Refer learners to **Let us Learn: 2** on page 135 of the Learner's Book.

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

- Use friendly jumps to solve these. Give learners subtraction sentence cards.

1)  $45 - 18 = ?$

2)  $56 - 27 = ?$

**High Ability Learners**

Work in pairs

1)  $73 - 21 = ?$

2)  $56 - 37 = ?$

3)  $84 - 43 = ?$

**Assessment for Learning**

Refer learners to Exercise 2 on page 138 of the Learner's Book.

**Suggested Home Work**

Use friendly jumps to solve these subtraction sentences.

- $32 - 25$
- $66 - 37$
- $82 - 39$

**Lesson 3:** Subtraction (using  
constant differences)**Starter**

Play “1 less than”. Say a number and learners subtract 1 from it, e.g.

- 1)  $19 \rightarrow 18$    2)  $15 \rightarrow 14$    3)  $6 \rightarrow 5$   
4)  $55 \rightarrow 54$

**Let Us Learn**

- Put learners into groups of five. Write this subtraction sentence on the board.  $64 - 22 = ?$  Explain the procedure to learners as follows.
  - Subtract 2 from each side. The subtraction sentence now becomes  $62 - 20 = 22$ .  
This is very easy. Have learners work these:
    - $57 - 31 = ?$
    - $46 - 22 = ?$
  - Make sure learners understand and apply this strategy correctly before moving on to adding subtraction sentences.
  - Write  $78 - 29$  on the board. Go through the working procedure with learners. Add 1 to each side. The subtraction sentence now becomes  $79 - 30$  which is easy to subtract.  $79 - 30 = 49$ .

**Note:**

- The constant strategy is easy because when you add the same amount to each number or subtract the same amount from each number you do not change the distance between the two numbers.

- Refer to **Let us learn: 3** on page 136 of the Learner’s Book. Go through the exercise with learners.

“Constant difference” is adding or subtracting the same amount from each number to create friendlier combinations.

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

- Work in pairs, subtract. Use constant difference strategy.
  - $46 - 22 = ?$
  - $36 - 19 = ?$

**High Ability Learners**

- Work in pairs.
- Use constant difference strategy to solve these.
  - $44 - 22 = ?$
  - $66 - 29 = ?$

**Assessment for Learning**

Refer learners to Exercise 3 on page 138 of the Learner’s Book.

**Suggested Home Work**

Solve these subtraction sentences. Use constant difference strategy.

- $75 - 29 = ?$
- $73 - 48 = ?$
- $86 - 68 = ?$
- $58 - 39 = ?$

For additional exercises on this module, refer to pages 82 - 85 of the Workbook.

**Module 18:** Word problems involving addition (up to 100)**Content Standard**

**B2.1.2.4:** Develop and use conventional and personal strategies for computing additions up to 100.

**Indicator**

**B2.1.2.4.3:** Solve one-step and multi-step word problems involving addition and subtraction within 100 using a variety of strategies based on place value, including algorithms.

**Learning Expectation**

Learners will be able to solve addition and

subtraction sentences using a variety of strategies.

**Essentials for Learning**

Learners can use strategies like the constant difference, friendly jumps or compensation to solve addition and subtraction sentences.

**New Words** Count down, count up, count on, count back

**Resources** 100 number chart, number line cards, word problem sentence cards

Number of Lessons **2**

**Lesson 1:** Addition word problems (using place value)**Starter**

Play "Guess my number": I am thinking of a number. My number is less than 12 but more than 10. What is my number?

**Find Out**

Refer learners to page 139 of the Learner's Book. Have them note the price of the book (GH¢10.00), and the amount he has, (GH¢7.00). State how much more is needed to buy the book. Elicit from learners how to write the addition or subtraction sentence and the strategy to be used to solve it.

$$10 - 7 = ?$$

$$7 + ? = 10$$

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

**Let Us Learn**

- Pose a word problem:  
Antwi has 28 pebbles. His mother added 30 more. How many pebbles has Antwi now?  
The sentence now becomes  $28 + 30 = ?$
- Give out the 100-number chart to learners. Revise with learners the movement on the number chart. Movement to the right is adding 1, to the left is subtracting 1, downwards is adding 10, upwards is subtracting 10.
- Give out the 100-number chart to learners in their groups. Learners find 28 on the chart. To add 30 means, moving 3 spaces

down from 28. You will be on 58. So  $28 + 30 = 58$ .

- Write a different addition sentence on the board for learners to solve.  
Example: Musa has 35 kola nuts, he went to buy 23 more. How many kola nuts has Musa now?  
Start on 35, move right 3 places and you will be on 38, move 2 spaces down and you land on 58. So  $35 + 23 = 58$   
*(Critical thinking, collaborative learning, problem solving skills)*
- Refer to **Let us learn: 1** on page 139 of the Learner's Book. Go through the exercise with learners.

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

- Work in pairs. Solve, using the 100-number chart.
- Teacher Antwi has 16 story books. The head teacher added 10 more. How many story books has teacher Antwi now?

**High Ability Learners**

- Work in pairs. Use the 100-number chart to solve this word problem.
- A farmer has 62 cocoa trees on one farm. He also has 37 on another farm. How many cocoa trees has he altogether?

**Assessment for Learning**

Refer learners to Exercise 1 on page 142 of the Learner's Book.

**Suggested Home Work**

- 1) Selasi has GH¢28 in his pocket. His father gave him GH¢15.00 more. How much has Selasi now?
- 2) Teacher Nkrumah has 48 red bottle caps. She also has 37 white bottle caps. How many caps has she altogether?

## Lesson 2: Addition word problems (using decomposition strategy)

**Starter**

Play "Guess my Number". I'm thinking of a number; it is more than 7 but less than 9. What is my number? (8)

**Let Us Learn**

- In groups of five, have learners solve the following word problem.
- Mr Asante has 24 ducks and 45 fowls. How many birds has he altogether?  
 $24 + 45 = ?$  using decomposition strategy.

$$24 + 45 = ?$$

$$24 + 45 = ?$$

$$20 + 40 + 4 + 5$$

$$60 + 9$$

$$\text{So } 24 + 45 = 69$$

Therefore Mr Asante has 69 birds altogether.

- Give learners some word problem cards. Have them solve them in pairs.

There are 33 exercise books in primary 2 class. The headteacher later added 46 more. How many books are in the class now?

Auntie Aba has 58 crates of eggs in her shop. Her poultry farmer added 16 more crates. How many crates of eggs has Auntie Aba now?

- Refer to **Let us learn: 2** on page 141 of the Learner's Book.  
Have learners solve the question  $36 + 16 = ?$  in pairs. Have learners write an addition sentences and solve it.

**Review Exercise****Low Ability Learners**

- Work in pairs (make sure learners don't work with the same learner all the time)
- A shopkeeper has 18 pencils in one box and 42 in another box. How many pencils has he altogether?

**High Ability Learners**

- Work in pairs. Teacher Mensah has ₵35.00 in his wallet. He also has ₵68.00 in his pocket. How much money has he altogether?

**Assessment for Learning**

Refer learners to page 142 of their textbooks for exercises.

**Suggested Home Work**

Use the decomposition strategy to solve these.

- 1) Agya Ansong brought 58 cocoa pods home. His wife Frempomah also brought 37 pods. How many pods of cocoa are in the house now?
- 2) Amina prepared 42 TZ balls to sell at the school canteen. Her daughter Fatima added 35 more. How many TZ balls has Amina to sell?

For additional exercises on this module, refer to pages 86 - 89 of the Workbook.



**Module 19:** Word problems involving subtraction (within 100)**Content Standard**

**B2.1.2.4:** Develop and use conventional and personal strategies for computing additions up to 100.

**Indicator**

**B2.1.2.4.3:** Solve one-step and multi-step word problems involving addition and subtraction within 100 using a variety of strategies based on place value, including algorithms.

**Learning Expectation**

Learners will be able to use place value chart to do subtraction within 100.

**Essentials for Learning**

Learners can use place value to do addition within 100.

**New Words**

Compensation, count down, count back, count up, backward, forward.

**Resources**

100 number chart, straws, word-problems cards.

Number of Lessons **3****Lesson 1:** Subtraction (using place value)**Starter**

Play: "2 less than". Mention a number and learners, say a number which is 2 less than it.

1)  $8 \rightarrow 6$     2)  $12 \rightarrow 10$     3)  $2 \rightarrow 0$

**Find Out**

Refer to page 143 of the Learner's Book. Deduce from learners "How much more he/she or they will have left after buying the book. They should be able to say the book is GH¢10.00 and the total amount he/she or they have is GH¢12.00. Expected answer should be  $\text{GH¢}12 - \text{GH¢}10 = \text{GH¢}2$ . So "how much more" left is GH¢2.00.

**Let Us Learn**

- Learners work in groups of five. Give out subtraction word problem cards to each group. They write the subtraction sentence and solve it.

Esinam has 58 bags of salt. Her husband Dela sold 23 bags. How many bags of salt are left?

Learners write the subtraction sentence as:  
 $58 - 23 = ?$ .

- Give out the 100 number chart to every group. Starting on 58, move 3 steps to the left, you will be on 55, then from 55 move 2 steps upwards. You will be on 35. So  $58 - 25 = 35$ .
- Have learners work in pairs to solve these: 1)  $62 - 28 = ?$  2)  $44 - 35 = ?$   
*(Critical thinking, collaborative learning, problem solving skills)*

- Refer to **Let us learn: 1** on pages 143 and 144 of the Learner's Book. Go through the exercise with learners:  $78 - 35 = ?$ . They should tell you how they will get the answer 43. That is, start on 78, move backwards 5 steps/spaces then move up 3 steps/spaces. You will be on 43, so  $78 - 35 = 43$ .

**Review Exercise**

Work in pairs.

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

- There are 38 erasers in a box. Teacher Fosu gave 17 to the class. How many erasers are left?

**High Ability Learners**

- Use the number chart to solve this. Fusenni has 82 cows. He sold 65 of them. How many are left?

**Assessment for Learning**

Refer learners to Exercise 1 on page 146 of the Learner's Book.

**Suggested Home Work**

Use the number chart to solve these.

- There are 50 pens in a box, 22 are red and the rest are blue. How many are blue?
- Alaba went to buy 72 fish at the sea-shore. She sold 67. How many fish are left?



## Lesson 2: Changing subtraction sentences to addition sentences

### Starter

Play “2 less than”. Mention a number and learners subtract 2 from it, for example:

- 1)  $8 \rightarrow 6$    2)  $12 \rightarrow 10$    3)  $5 \rightarrow 3$

### Let Us Learn

- Have learners work in pairs. Give out subtraction word problem cards to them. Let them explain how they understand the problem and solve it with their partners. They change it to an addition sentence.

A tailor has 65 school uniforms. He sold 36 of them. How many are left?

- The subtraction sentence is  $65 - 36 = ?$ . This could be turned into an addition sentence as  $36 + ? = 65$ . Learners can use ‘counting on’ and ‘friendly jumps’ to get the answer. Remember the total number of jumps represent the answer, so  $36 + 29 = 65$ .
- Working in pairs, learners change these subtraction sentences into addition sentences and solve them.
  - Mommy has 30 eggs, 8 got broken. How many are left.  $30 - 8 = ?$
  - Mr. Oti has a number of spraying machines. 22 are in bad condition and 16 are in good condition. How many does Mr. Oti have in total  $\square - 22 = 16$ .
- Refer to **Let us learn: 2** on page 145 of the Learner’s Book. Learners read and change the subtraction sentence into an addition sentence ( $40 + 25 = ?$ ). Go through the steps there with learners.  
 $40 + 25 = ?$

### Review Exercise

### Differentiated Lessons

#### Low Ability Learners

- Learners work in pairs to change the subtraction sentence into an addition sentence and solve it.
  - There are 28 oranges on a tree. 19 dropped from the tree. How many oranges are left on the tree?

### High Ability Learners

- Learners work in pairs to change the subtraction sentence into an addition sentence and solve it.  
A number of basket balls are in a box. The coach took out 36. There are 25 in the box now. How many balls were in the box at first?

### Assessment for Learning

Refer learners to Exercise 2 on page 147 of the Learner’s Book. Let them change the subtraction sentences to addition sentence and solve them.

### Suggested Home Work

Change the following subtraction sentences into addition sentences and solve them.

- Besease DA Primary School has 62 hockey sticks. Fodua DA School borrowed 26. How many hockey sticks are left in the school?
- There are a number of mangoes in a basket. 38 are rotten, and 19 are good. How many mangoes are in the basket?

## Lesson 3: Subtraction using compensation

### Starter

Play “1 less than” Mention a number and learners reduce it by 1 and say it out loud.

Example:

- 1)  $9 \rightarrow 8$    2)  $11 \rightarrow 10$    3)  $20 \rightarrow 19$   
4)  $50 \rightarrow 49$

### Let Us Learn

- Working in groups of five, learners write a subtraction sentence for the word problem.

Musa has 55 kola nuts. He gave 18 to his teacher. How many kola nuts has Musa now?

Elicit from learners how to write the subtraction sentence for the word problem: i.e.  $55 - 18 = ?$ .

- Using the compensation strategy, learners add 2 to 18 to make 20. Subtracting 20 from 55 gives 35, which is easier. Because we subtracted 2 more than expected, we

add 2 to the answer.

$$55 - 20 = 35$$

$$35 + 2 = 37$$

So  $55 - 18 = 37$ . Therefore Musa has 37 kola nuts.

- Refer learners to **Let us learn: 3** on page 145 of the Learner's Book. Go through "Let us learn 3" with learners.  
 $50 - 28 = ?$  Add 2 to 28 to make 30.  
 Subtract 30 from 50 that gives 20.  $20 + 2$  because we subtracted 2 more, we have to add 2 to the answer.  
 $20 + 20 + 20 + 5$   
 $60 + 5 = 65$  so Auntie Mansah gave 65 pencils out.

### Review Exercise

Use compensation strategy.

### Differentiated Lessons

#### Low Ability Learners

- Learners work in pairs to solve this.  
 1) I have 25 eggs. I used 8 for breakfast.  
 How many eggs do I have now?

#### High Ability Learners

- There are 75 Mathematics and English textbooks on a shelf. 47 are English textbooks. How many are Mathematics text books?

### Assessment for Learning

Refer learners to Exercise 2 on page 142 of the Learner's Book. Let them use the compensation strategy.

### Suggested Home Work

Use the compensation strategy to solve these.

- I have a number of bulbs in my box. 26 are broken. I now have 32 good ones.  
 How many bulbs did I have at first?
- There are 85 oranges in a basket, but 35 are bad. How many are good?

For additional exercises on this module, refer to pages 90 - 94 of the Workbook.

Encourage learners to do the reflection exercises on pages 148 and 149 after this sub-strand.

Learners complete the self-assessment table on page 150. This will help you know each learner's strength and weaknesses.

## Module 1: Making halves

**Content Standard**

**B2.1.3.1:** Develop an understanding of halves and fourths using concrete and pictorial representations.

**Indicators**

**B2.1.3.1.1:** Understand the fraction one-half and one-quarter as the quantity obtained by taking one part when a whole is partitioned into two or four equal parts.

**B2.1.3.1.2:** Count in halves and quarters (fourths) using concrete and pictorial representations of halves and fourths.

**B2.1.3.1.3:** Determine the number of halves and quarters in a whole.

**Learning Expectation**

Learners will be able to identify 'half' and make 'halves' from a whole.

**Essential for Learning**

Learners can share objects among themselves.

**New Words:** Halves, one-half, whole, part.

**Resources:** Sheets of paper, colour pencils, oranges, diagrams showing halves of objects etc.

Number of Lessons **2**

## Lesson 1: Making halves

**Starters**

Engage learners to perform some mental math games. Sing a song "I am counting one, what is one?"

**Find Out**

Direct learners to page 151 of the Learner's Book.

**Ask:** What can you say about the watermelon? Expect answers such as:

1 watermelon

Half a watermelon

**Let Us Learn**

- Put learners into groups of six.  
Give each group an orange.  
Task the groups to cut the orange into two equal halves.
- Present learners with sheets of paper and task them to draw any shape and colour one half of it. (*Justification of Ideas, Critical thinking, justification of ideas*)
- Direct learners to **Let us learn: 1** on page 151 of the Learner's Book. Engage the learners to talk about the items.

**Review Exercise****Differentiated lesson****Low Ability Learners**

- Present learners with two pictures of objects and task them to shade halves of the objects.

**High Ability Learners**

- Present learners with five pictures of objects and task them to shade halves of the objects.

**Assessment for Learning**

Refer learners to Exercise 1 on pages 152 and 153 of the Learner's Book.

## Lesson 2: Counting halves

**Starter**

Engage learners to perform some mental math strategies. E.g. Skip count by 5s and 10s up to 100.

**Let Us Learn**

- Direct learners to **Let us learn: 2** on page 152 of the Learner's Book. Engage the learners to talk about what they see.
- Put learners into groups and task them to fold a number of sheets into two equal parts. Let them count and record the number of halves they can count.
- Give each group time to present their result and justify their answers. (*Collaborative learning, Critical thinking, justification of ideas*)
- Pair learners to draw different shapes. Divide them into halves and shade one part. Learners also count and record the number of halves they get from their activity.

**Review Exercise****Differentiated lesson****Low Ability Learners**

- Give learners a number, say 10. Task them to use paper folding to show 10 halves.

**High Ability Learners**

- Give learners a number, say 16 halves. Ask learners to mentally tell how many whole are there in the halves.

**Assessment for Learning**

Refer learners to Exercise 2 on pages 153 and 154 of the Learner's Book.

For additional exercises on this module, refer to pages 95 - 96 of the Workbook.

## Module 2: Making quarters

**Content Standard**

**B2.1.3.1:** Develop an understanding of halves and fourths using concrete and pictorial representations.

**Indicator**

**B2.1.3.1.1:** Understand the fraction one-half and one-quarter as the quantity obtained by taking 1 part when a whole is partitioned into two or four equal parts.

**B2.1.3.1.2:** Count in halves and quarters (fourths) using concrete and pictorial representations of halves and fourths.

**B2.1.3.1.3:** Determine the number of halves and quarters in a whole.

**Learning Expectation**

Learners will be able to identify and say what a quarter is; make a quarter from a whole, and count quarters.

**Essential for Learning**

Learners can identify a half and a whole and differentiate a half from a whole object.

**New Words**

Halves, one-quarter, quarter, whole.

**Resources**

Sheets of paper, colour pencils, oranges, diagrams showing quarters of objects, string, etc.

Number of Lessons **2**

## Lesson 1: Making quarters

**Starters**

Engage learners to perform some mental math games. Sing "I am counting one, what is one?".

**Find Out**

Direct learners to page 155 of the Learner's Book.

**Ask:** How many learners can you count? How many will each get if they share 4 items? If each learner gets 1, How will you call it?

**Let Us Learn**

- From the discussion in the **Find out**, brainstorm the meaning of a quarter.
- Demonstrate how to make a quarter using a sheet of paper. Also, call four learners to the front of the class to share four items. Explain that each learner's share is called "one quarter".
- Direct learners to **Let us learn: 1** on page 155 of the Learner's Book. Engage the learners to identify the items that are quarters and those that are not.
- Put learners into groups and give each group a string. Task each group to cut the string into four equal parts to show one quarter.
- Present learners with sheets of paper. Task them to draw any shape and colour one quarter of it. (**Critical thinking, justification of ideas**)

**Review Exercise****Differentiated lesson****Low Ability Learners**

- Present learners with four pictures of objects and task them to shade quarters of the objects.

**High Ability Learners**

- Present learners with sheets of paper and task them to draw objects and shade one quarter of each object.

**Assessment for Learning**

Refer learners to page 157 of the Learner's Book for exercise.

## Lesson 2: Counting quarters

**Starter**

Engage learners to perform some mental math activities. E.g. Skip count by 5s and 10s.

**Let Us Learn**

- Direct learners to **Let us Learn: 2** on page 156 of the Learner's Book. Engage the learners to talk about what they see.
- Revise learners' previous knowledge on quarters.
- Put learners into groups and task them to fold a number of sheets of paper into

quarters and then count and record the number of quarters. (**Collaborative learning**)

- Give the groups time to present their result and justify their answers. (**Critical thinking and justification of ideas**).
- Pair learners to draw different shapes and divide them equally into four and shade one part. Learners also count and record the number of quarters that are in the shapes.

### Review Exercise

#### Differentiated lesson

##### Low Ability Learners

- Give learners a number, e.g. 12. Task them to use paper folding to show 12 quarters.

##### High Ability Learners

- Give learners a number, e.g. 16. Ask learners to mentally tell how many wholes there are in 16 quarters.

#### Assessment for Learning

Refer learners to Exercise 2 on page 158 of the Learners Book.

For additional exercises on this module, refer to pages 97 - 99 of the Workbook.



**Module 3:** Halves and quarters of an amount**Content Standard**

**B2.1.3.1:** Develop an understanding of halves and fourths using concrete and pictorial representations.

**Indicator: 1**

**B2.1.3.1.1:** Understand the fraction one-half and one-quarter as the quantity obtained by taking 1 part when a whole is partitioned into two or four equal parts

**Learning Expectation**

Learners will be able to identify half of an amount, a quarter of an amount, and make a half and a quarter from a given amount.

**Essential for Learning**

Learners can identify a half and a quarter, and describe a half and a quarter of a whole.

**New Words**

Halves, one-quarter, quarters, whole, amount

**Resources**

Sheets of paper, counters, straws, colour pencils, oranges, diagrams showing halves of objects, etc.

Number of Lessons

3

**Lesson 1:** Identifying half of amount (I)**Starter**

Engage learners to perform some mental math games. Give them basic facts that can be solved by “making 10s” up to 100.

**Find Out**

Direct learners to page 159 of the Learner's Book.

**Ask:** How many learners can you count? How many will each get if they share 4 items? If each learner gets 1, how will you call it?

**Let us Learn:**

- Call out two learners to the front of the class.  
Put 8 straws on the front table and ask the two learners to share them equally.  
Then put out 16 bottle caps and also ask them to share them equally.  
Engage learners to explain that half of amount means dividing a group of objects into two equal parts.
- Put learners into convenient groups.  
Ask each group to make four groups of counters (4, 8, 12, and 20).
- Task each group to divide each group of counters into two equal parts and present their result to the class with justifications.  
**(Collaborative learning, Critical thinking)**

- Present learners with sheets of paper and task them to draw a number of items and show half of the amount by shading.
- Refer to **Let us learn: 1** on page 159. Go through the exercise with learners.

**Review Exercise****Differentiated lesson****Low Ability Learners**

- Give learners 20 bottle tops. Task learners to divide them into two equal parts.

**High Ability Learners**

- Task learners to mentally tell you what a half of 100 sticks is.

**Assessment or learning:**

Refer learners to Exercise 1 on page 160 of the Learner's Book.

## Lesson 2: Identifying half of amount (2)

### Starter

Engage learners to perform some mental math games. Give them basic facts that can be solved by “making 10s” up to 100.

### Let us learn

- Put learners into groups.
- Give learners a table of values;

Number of items	<u>8</u>	<u>14</u>	<u>24</u>	<u>32</u>
Halves				

- Task learners to count a number of counters to represent the number of items in the table. Then they divide the counters into two equal parts and record how many there are in each half.
- Learners present their answers and explain their results.

### Review Exercise

### Differentiated lesson

#### Low Ability Learner

- Task learners to count and tell the half of a given number. Example 10, 12, 18 and 20.

#### High Ability Learners

- Task learners to mentally tell what half of a given number is. Example 50, 80 and 100.

### Assessment for Learning

Refer learners to Exercise 2 on page 161 of the Learner’s Book.

### Suggested Homework

- Draw 6 oranges and put them into two equal parts.
- Draw 8 squares and divide them into two equal halves.
- Draw four triangles and colour half of the 4.

## Lesson 3: Identifying quarter of amount (1)

### Starter

Engage learners to perform some mental math games. Give them basic facts that can be solved by “making 10s” up to 100.

### Let us Learn

- Call out four learners to the front of the class. Put 8 straws on the front table and ask the four learners to share them equally. Then put 16 bottle caps and also ask them to share them equally. Engage learners to explain that quarter of an amount means dividing a group of objects into four equal parts.
- Put learners into groups. Ask each group to make four groups of counters (8, 12, 16 and 28).
- Task each group to divide each group of counters into four equal parts and present their result to the class. They should justify their answers. (**Collaborative learning, Critical thinking**).
- Present learners with sheets of paper and task them to draw a number of items and shade a quarter of them.
- Refer to **Let us learn: 2** on page 160 of the Learner’s Book. Go through the exercise with learners.

### Review Exercise

### Differentiated lesson

#### Low Ability Learners

- Task learners to divide a given set of items into four equal parts. Example 20 and 40.

#### High Ability Learners

- Task learners to mentally tell a quarter of a given group of items. Example 60 and 100.

### Assessment for Learning

Refer learners to Exercise 3 on page 162 of the Learner’s Book.

## Lesson 4: Identifying quarter of amount (2)

### Starters

Engage learners to perform some mental math games. Sing a song "I am counting one, what is one?".

### Let us learn

- Put learners into groups of five.  
Give learners a table of values.

Number of items	12	24	32	40
Quarter				

- Task learners to count a number of counters to represent the number of items in the table.
- They divide the counters into four equal parts and record how many there are in each part.
- Learners present their answers and explain their results.

### Review Exercise

#### Differentiated lesson

##### Low Ability Learners

- Task learners to count and find a quarter of a given number. Example 20 and 40.

##### High Ability Learners

- Task learners to mentally find a quarter of a given number. Example 60 and 100.

#### Assessment for Learning

Refer learners to Exercise 4 on page 162 of the Learner's Book.

#### Suggested Homework

- Draw 12 oranges and divide them into four equal parts.
- Draw 16 sticks and divide them into two equal halves.
- Draw 8 triangles and colour a quarter of the four.

For additional exercises on this module, refer to pages 100 - 101 of the Workbook.

Encourage learners to do the reflection exercises on page 163 after this sub-strand.

Learners complete the self-assessment table on page 164. This will help you know each learner's strength and weaknesses.

**Module 1:** Recognise Ghanaian coins and notes by name**Content Standard**

**B2.1.4.1** Determine the value of coins and notes in order to solve monetary transactions

**Indicator**

**B2.1.4.1.1:** Recognize Ghanaian coins, and currency notes to include at least 1 cedi, 2 cedis, 5 cedis, 10 cedis, 20 cedis and 50 cedis and determine the value of a collection of coins and notes up to at least 50 Ghana cedis

**Learning Expectation:**

Learners will be able to recognise Ghanaian coins and notes by name, tell the relationship

between coins and the relationship between notes.

**Essential for Learning**

Learners can identify some features of the Ghanaian coins and count by 1s and 2s up to 100.

**New Words:**

Coin, cedi, pesewa, note.

**Resources**

Ghana pesewa coins, 1 cedi note.

Number of Lessons **3**

**Lesson 1:** Identifying the Ghana pesewa coins**Starter**

Play "How many fingers up; how many fingers down?"

Raise fingers (1 to 5 or 1 to 10).

**Ask:** How many fingers do you see?

Learners call out the answer together.

The aim of the game is to develop speed so move quickly from one group of fingers to the next.

**Find Out**

Direct learners to page 165 of the Learner's Book.

**Ask:** What is the boy holding? What do we use it for? Do you have some with you? Tell one thing that you bought with money.

**Let Us Learn**

- Put learners into small groups of about six.
- Display the Ghana pesewa coins in front of each group. Have learners examine the coins carefully.
- Conduct a class voting for the groups to choose two out of the coins to discuss their features in their groups. (**Collaborative learning, personal development**)

- Call upon each group to make a presentation using the following criteria:  
The features on each coin.  
The colour of each coin  
Some of the items they can buy with the coin. (**Justification of Ideas**)
- Direct learners to **Let us learn** on page 165. Lead the class to identify the coins together.
- Brainstorm which of the coins is bigger in value than the others. **Ask:** Which one can buy more. 20p or 50p?.

**Review Exercise****Differentiated lesson****Low Ability Learners**

- Present learners with some pesewa coins to identify and tell the differences in value.

**High Ability Learners**

- Present learners with coins to tell how much more is one coin bigger/smaller than the other in value.

**Assessment for Learning**

Refer learners to Exercise 1 on pages 166 and 167 of the Learner's Book.

## Lesson 2: Identifying 1, 2 and 5 Ghana cedi notes

### Starter

Play doubles game. Learners mention the doubles of these numbers. 4, 5 and 10.

### Let us Learn

- Use the Learners' groups from the previous lesson.
- Display the 1, 2 and 5 Ghana cedis notes in front of each group. Task learners to examine the notes carefully. Conduct a class voting for the groups to choose one of the notes to discuss the features in their groups.
- Call up each group to make a presentation using the following criteria:  
The features on the note (pictures, writings, etc.)  
The colour of the note.  
Some items they can buy with the note.  
**(Collaborative learning, Personal development, Justification of ideas)**
- Direct learners to **Let us learn** on page 166 of the Learner's Book. Lead the class to identify the 1, 2 and 5 Ghana cedi notes together.
- Brainstorm which of the notes is bigger in value than the other. **Ask:** Which one can buy more items than the other: GH¢2 or GH¢5?.

### Review Exercise

#### Differentiated lesson

##### Low Ability Learners

- Present learners with some cedi notes to identify and tell the differences in value. GH¢2 and GH¢1.

##### High Ability Learners

- Present learners with notes to tell how much more is one note bigger/smaller than the other. GH¢2 and GH¢5.

#### Assessment for Learning

Refer learners to Exercise 2 on page 167 of the Learner's Book.

## Lesson 3: Identifying 10, 20 and 50 Ghana cedi notes

### Starter

Let learners count forward and backwards 1-20.

### Let us Learn

- Direct learners to **Let us learn** on page 166 of the Learner's Book.
- Revise learners' knowledge on 1, 2 and 5 Ghana cedi notes.
- Put learners into groups of six. Display the 10, 20 and 50 Ghana cedis in front of each group. Task learners to examine the notes carefully.
- Hold a whole class discussion on each of the notes using the following criteria:  
The features on the note (pictures, writings, etc.)  
The colour of the note.  
Some of the items they can buy with the note. **(Justification of ideas, collaborative learning)**
- Brainstorm which of the notes is bigger in value than the other. **Ask:** Which one can buy more: GH¢20 or GH¢50?

### Review Exercise

#### Differentiated lesson

##### Low Ability Learners

- Present learners with some cedi notes to identify and tell the differences in value.

##### High Ability Learners

- Present learners with notes to tell how much more is one note bigger/smaller than the other in value.

#### Assessment for Learning

Refer learners to page 168 of the Learner's Book for exercise.

#### Suggested Homework

- 1 Write three items you can buy with a 2, 5 and 10 cedi notes.
- 2 Tell how many 5 cedi notes make 50 cedis.
- 3 Tell how many 10 and 20 cedi notes make 50 cedis.

For additional exercises on this module, refer to pages 102 - 103 of the Workbook.

**Module 2:** Relationship among the cedi notes**Content Standard**

**B2.1.4.1:** Determine the value of coins and notes in order to solve monetary transactions.

**Indicator**

**B2.1.4.1.1:** Recognise Ghanaian coins, and currency notes to include at least 1 cedi, 2 cedis, 5 cedis, 10 cedis, 20 cedis and 50 cedis and determine the value of a collection of coins and notes up to at least 50 Ghana cedis

**Learning Expectation**

Learners will be able to recognise Ghanaian

notes by name and value and tell the relationship between the coins.

**Essential for Learning**

Learners are able to identify the Ghanaian notes by name and value and tell which coin is bigger in value than the other.

**New Words**

Coin, cedi, pesewa, note, value

**Resources**

Ghana pesewa coins, 1 cedi note

Number of Lessons **2**

**Lesson 1:** Relationship among the Ghana cedi notes (I)**Starter**

Play "One (or two) more/less than".

Call out a number.

Learners must call out a number that is one or two more/less than the number you called.

The aim of the game is to develop speed so move quickly from one number to the next.

**Find Out**

Direct learners to page 169 of the Learner's Book.

**Ask:** Is the one 5 cedi note enough to buy the two tins of milk? How many can it buy? How many more of the 5 cedi note is needed to buy the two tins of milk? How many tins of milk will four of the 5 cedi notes buy?

**Let us Learn**

- Put learners into small groups of about five. Display the Ghana cedi notes in front of each group. Task learners to make groups of notes that make other equivalent notes. E.g. 2 of the 10 Ghana cedi notes make one 20 cedis. *(Collaborative learning, justification of ideas)*

- Direct learners to **Let us learn** on page 169 of the Learners' Book. Lead the class to identify the notes and the relationships.
- Brainstorm which of the sets of notes are equivalent to other notes.

**Review Exercise****Differentiated lesson****Low Ability Learners**

- Present learners with a selected cedi note. They choose a number of notes that will be equivalent to the note selected. E.g. give learners GH¢20 note. They select four GH¢5 notes.

**High Ability Learners**

- Task learners to make four different combinations of notes that make GH¢50.

**Assessment for learning**

Refer learners to page 171 of the Learner's Book for exercise.



## Lesson 2: Relationship among the Ghana cedi notes (2)

### Starter

Play “One (or two) more/less than”.

Call out a number.

Learners must call out a number that is one or two more/less than the number you called.

The aim of the game is to develop speed so move quickly from one number to the next.

### Let us Learn

- Use learners previous groups. Display the Ghana cedi notes in front of each group. Also, display items such as a milo can, notebook, water bottle and school bag, with price tags.
- Task learners to make different combinations of notes that can buy the items. E.g. 1 of GH¢ 5 or 2 of GH¢2 and 1 of GH¢1 can buy a notebook.
- Demonstrate, then discuss with learners, combinations of coins that make GH¢50.

### Review Exercise

### Differentiated lesson

#### Low Ability Learners

- Present learners with price tags and challenge them to choose appropriate

notes or combinations of notes that can buy the items.

### High Ability Learners

- Task learners to combine different notes that make up GH¢50.

### Assessment for learning

Refer learners to page 172 of the Learner's Book for exercise.

### Suggested Homework

1. How many GH¢2 and GH¢1 make GH¢5?
2. How many GH¢20 and GH¢10 make GH¢50?
3. How many GH¢10 make GH¢50?
4. How many 10p coins make 50p?
5. How many GH¢5 make GH¢50?

For additional exercises on this module, refer to pages 104 - 106 of the Workbook.

Encourage learners to do the reflection exercise on page 173 after this sub-strand.

Learners complete the self-assessment table on page 174. This will help you know each learner's strength and weaknesses.

2

Strand:

**Algebra**

## Module 1: Increasing and decreasing number patterns

### Content Standard

**B2.2.1.1:** Recognise, create, extend, describe, and use patterns and rules to solve mathematical tasks

### Indicator

**B2.2.1.1.1:** Demonstrate an understanding of increasing and decreasing number patterns

### Learning Expectation

Learners need to be able to identify the pattern rules used to create a pattern that increase by 2, 5, and 10.

### Essentials for Learning

Learners can continue patterns with shapes.

### New words

Increase, decrease, rule, extend, pattern.

### Resources

Number cards 1 to 20, numeral cards in multiples of 2, 5 and 10.

Number of Lessons **2**

## Lesson 1: Increasing number patterns

### Starter

Learners recite the rhyme: Can you count "1, 2, 3".

### Find Out

Refer learners to page 176 of the Learner's Book. Learners in pairs critically look at the patterns and find the missing numbers. They justify their answers. (**Critical thinking, justification of ideas, collaborative learning**)

### Let us Learn

- Put learners into groups of five. Give out these number pattern cards to the groups.
  - 10, 12, 14, 16.....
  - 42, 47, 52.....
  - 63, 73, 83.....
  - 51, 56, 61.....
- Learners identify the rule for the patterns and extend the pattern with the next 2 terms. Learners change over and swap the questions. (**Critical thinking, collaborative learners, justification of ideas**)
- Refer to **Let us learn: 1** on pages 176 to 177 of the Learner's Book. Go through the exercises with learners.

### Review Exercise

Working in groups of four, learners identify the rules and extend the pattern for the next two terms.

- 42, 47, 52.....
- 16, 18, 20.....
- 41, 51, 61.....

### Assessment for Learning

Refer learners to Exercise 1 on pages 179 and 180 of the Learner's Book.

## Lesson 2: Decreasing number patterns

### Let Us Learn

- Put learners into groups of five. Give out these number pattern cards to the groups. They critically look at the patterns, identify the rule and continue with 2 terms.
  - 17, 15, 13.....
  - 68, 63, 58.....
  - 72, 62, 52.....
  - 64, 62, 60.....
- Refer to **Let us learn: 2** on pages 178 to 179 of the Learner's Book. Go through the activities with learners.

### Review Exercise

Working in groups of four, learners continue 2 terms of the pattern and find a rule for each of them.

- 80, 70, 60, ..., .....
- 66, 63, 60, ..., .....

### Assessment for Learning

Refer learners to Exercise 2 on pages 180 and 181 of the Learner's Book.

### Suggested Home Work

Create your own 2 number patterns. Learners should discuss their work the next day in class.

For additional exercises on this module, refer to pages 108 - 110 of the Workbook.

**Module 2:** Identifying errors/omissions in patterns**Content Standard**

**B2.2.1.1:** Recognise, create, extend, describe, and use patterns and rules to solve mathematical tasks

**Indicator**

**B2.2.1.1.1:** Demonstrate an understanding of increasing and decreasing number patterns

**Learning Expectation**

Learners will be able to identify errors in a given pattern.

**Essentials for Learning**

Learners can create patterns with 2D shapes with different colours.

**New words**

Error, increasing, decreasing.

**Resources**

Numeral cards (1 to 20), 2D shapes.

Number of Lessons **3**

**Lesson 1:** Identifying errors in patterns increasing by 2s**Starter**

Have learners sing the song "A circle is a shape".

**Find Out**

Refer learners to **Find out: A** on page 182 of the Learner's Book. Learners look at the pattern critically. They identify the pattern and find the number which does not fit in the pattern, which is 33. (**Critical thinking**).

**Let us Learn**

- Put learners into groups of five. Write these number patterns on the board  
1) 18, 19, 20, **22**, 21, 22,      2) 32, 34, 36, **39**, 38.  
Learners study the patterns critically and identify the errors. The errors are 22 and 39 respectively. (**Critical thinking, collaborative learning**)
- Refer to **Let us learn: 1** on page 182 of the Learner's Book. Working in groups of five, learners study the pattern and identify the error in it.

**Review Exercise****Differentiated lesson****Low Ability Learners**

- Working in pairs, learners identify the errors in these patterns.  
1) 20, 25, 40, 30, 35  
2) 30, 40, 50, 70, 60

**High Ability Learners**

- Have learners work in pairs to identify the errors.  
1) 2, 4, 8, 6      2) 30, 35, 40, 50, 45  
3) 42, 52, 75, 62.

**Assessment for Learning**

Refer learners to Exercise 1 on page 183 of the Learner's Book.

**Suggested Home Work**

Identify the error in each pattern.

- 10, 20, 30, 60, 40
- 5, 10, 15, 16, 20
- 3, 6, 9, 12, 15

**Lesson 2:** Identifying errors in patterns decreasing by 5s**Starter**

Learners sing the song "I'm counting one".

**Let Us Learn**

- Put learners into groups of five. Give out pattern cards for learners to study and identify the error in each pattern.  
1) 20, 18, 16 15, 14      2) 50, 45, 60, 40, 35
- Learners go round and compare their answers. In question one, the error is 15. The numbers are decreasing by 2. In question 2, the numbers are decreasing by 5 and the error is 60. (**Critical thinking, collaborative learning, justification of ideas**)

- Write these number patterns on the board for learners to identify the errors.
  - 33, 43, 53, 73, 63,
  - 67, 57, 47, 67, 27.
- They should work in pairs. (**critical thinking/collaborative learning**)
- Refer to learners book page 182 Have learners go through the exercise and identify the errors.

### Review Exercise

#### Differentiated lesson

##### Low Ability Learners

Learners should work in pairs and identify the errors.

- 23, 21, 20, 19, 17
- 42, 52, 32, 22, 12

##### High Ability Learners

Learners should work in pairs and identify the errors.

- 84, 81, 79, 77,
- 33, 32, 28, 23,
- 88, 78, 68, 57,

#### Assessment for Learning

Refer learners to Exercise 2 on page 184 of the Learner's Book.

### Lesson 3: Identifying errors in patterns increasing by 10

#### Starter

Learners sing the song "One man went to farm".

#### Let Us Learn

- Put learners into groups of six. Write out number patterns on the board and let learners study them and identify the errors.

8	18	28	49	38	48
23	33	43	53	60	63

- Learners write their answers and compare them with those of other group members. In both questions the numbers are increasing by 10. The error in question

1 is 49 and in question 2 the error is 60.

(**Collaborative learning, critical thinking**)

- Give learners number pattern cards. Learners work in pairs to identify the errors.

1)	42	52	62	70	72		
2)	37	47	57	67	67	86	87

- Learners discuss their answers with the whole class.
- The numbers are increasing by 10. Therefore, the errors are 70 and 86 in questions 1 and 2 respectively.
- Refer to the Learner's Book page 183 Have learners go through the **Let us learn: 3** exercise and identify the error.

### Review Exercise

#### Differentiated lesson

##### Low Ability Learners

- Work in groups of three. Identify the errors in each pattern.
  - 15, 25, 26, 35
  - 4, 14, 24, 34, 45, 44
  - 20, 30, 40, 55, 50

##### High Ability Learners

- Identify the errors in these patterns. Work in pairs.
  - 48, 58, 68, 75, 78.
  - 35, 44, 55, 65, 75, 85.
  - 27, 37, 48, 47, 57.
  - 13, 23, 30, 33, 43, 53.

#### Assessment for learning

Refer learners to Exercise 3 on page 184 of the Learner's Book.

#### Suggested Home Work

Identify the errors in the following:

- 6, 16, 26, 36, 46, 56, 53
- 14, 24, 29, 34, 44
- 29, 30, 39, 49, 59
- 70, 80, 90, 60, 100

For additional exercises on this module, refer to pages 111 - 112 of the Workbook.

**Module 3:** Finding missing terms in pattern**Content Standard**

**B2.2.1.1:** Recognise, create, extend, describe, and use patterns and rules to solve mathematical tasks.

**Indicator**

**B2.2.1.1.1:** Demonstrate an understanding of increasing and decreasing number patterns.

**Learning Expectation**

Learners will be able to find missing terms and continue the pattern with 2 or 3 terms.

**Essentials for Learning**

Learners can identify errors in patterns.

**New words**

Missing, pattern, increasing, decreasing

**Resources**



Numeral cards (1 to 20).

Number of Lessons **2**

**Lesson 1:** Repeated addition pattern**Starter**

Learners sing the song "A circle is a shape".

**Find Out**

Refer to the Learner's Book page 185. Have learners study the patterns in pairs and find the missing number and shapes. The missing number is 70 and the missing shapes are , .

**Let us Learn**

- Write these repeated addition patterns on the board. Working in pairs, learners study the pattern and continue with the next 2 terms.
  - 1, 3, 5, 1, 3, 5, 1, 3, 5, .....
  - 3, 5, 7, 9, .....
  - 15, 20, 25, .....

The first one is just a repetition of 1,3,5; the second one is adding 2 to the last number; and the third one is adding 5 to the last number. (**Critical thinking, collaborative learning**)
- Refer to **Let us learn: 1** on page 185 of the Learner's Book. Go through the patterns there with learners.

**Review Exercise****Differentiated lesson****Low Ability Learners**

- Working in pairs, learners continue these patterns with the next 2 terms.
  - 4, 5, 6, 4, 5, 6, \_\_\_\_\_
  - 19, 17, 15, 19, \_\_\_\_\_

**High Ability Learners**

- Work in pairs. Continue these patterns with the next 2 terms.
  - 72, 73, 74, .....
  - 52, 62, 72, .....
  - 73, 78, 83, .....

**Assessment for Learning**

- Refer learners to Exercise 1 on page 186 of the Learner's Book.

**Suggested Home Work**

Continue these patterns with 2 terms.

- 10, 20, 30, \_\_\_\_\_, \_\_\_\_\_
- 4, 6, 8, \_\_\_\_\_, \_\_\_\_\_
- 6, 11, 16, \_\_\_\_\_, \_\_\_\_\_

**Lesson 2:** Repeated subtraction pattern**Starter**

Learners sing the song "Can you count 1, 2, 3".

**Let Us Learn**

- Put learners into groups of five. Give them these number pattern cards to continue with 2 terms.

- |    |    |    |       |       |
|----|----|----|-------|-------|
| 40 | 35 | 30 | ----- | ----- |
|----|----|----|-------|-------|
- |    |    |    |       |       |
|----|----|----|-------|-------|
| 38 | 33 | 28 | ----- | ----- |
|----|----|----|-------|-------|
- |    |    |    |       |       |
|----|----|----|-------|-------|
| 88 | 86 | 84 | ----- | ----- |
|----|----|----|-------|-------|



- Learners move round to compare their answers with others. Learners justify how they got the answers. The first one is decreasing by 5, the second one is also decreasing by 5 and the third one is decreasing by 2. (**Justification of ideas, critical thinking, collaborative learning**)
- In their groups, learners create their own patterns with numbers 2, 5, and 10 in decreasing order.
- Refer to **Let us learn: 2** on page 185 of the Learner's Book. Learners study the pattern and continue with the next two terms.

### Review Exercise

### Differentiated lesson

#### Low Ability Learners

- Have learners create 2 patterns decreasing by 1 and 2. They should work in groups.

### High Ability Learners

- Working in pairs, learners create 3 repeated subtraction patterns with numbers decreasing by 2, 5 and 10.

### Assessment for Learning

Refer learners to Exercise 2 on page 186 of their Learner's Book.

### Suggested Home

Continue these patterns with the next 3 terms.

- 1) 88, 86, 84, \_\_\_\_\_
- 2) 74, 64, 54, \_\_\_\_\_
- 3) 20, 19, 18, \_\_\_\_\_
- 4) 90, 80, 70, \_\_\_\_\_

For additional exercises on this module, refer to pages 113 - 114 of the Workbook.

**Module 4:** Identifying and describing rules for patterns**Content Standard**

**B2.2.1.1:** Recognise, create, extend, describe, and use patterns and rules to solve mathematical tasks

**Indicator**

**B2.2.1.1.2** Identify, create and describe the rule for simple number patterns involving repeated addition or subtraction, skip counting and arrays of objects.

**Learning Expectation**

Learners will be able: to identify and describe

rules for a given pattern and continue with the next 2 or 3 terms.

**Essentials for Learning**

Learners can identify errors in number patterns.

**New words**

Pattern, rule, arrange, create, term

**Resources**

Numeral cards, 2D shapes in different colours.

Number of Lessons **3**

**Lesson 1:** Finding rules for addition patterns**Starter**

Sing a song on shapes, "A circles is a shape"

**Find Out**

Refer to **Find out: A** on page 187 of the Learner's Book. Learners find the next term of Seidu's pattern.

**Let us Learn**

- Working in groups of five, learners study these patterns.  
1) 1, 3, 5, 7.....  
2) 5, 7, 9, 11.....  
Learners brainstorm in their groups and identify the patterns and the rules for them. The patterns are increasing by 2s and the rule is "+2".  
Therefore the next 3 terms for question 1 are 9, 11, 13 and for question 2 are 13, 15, 17. (**Critical thinking, collaborative learning**)
- Refer learners to **Let us learn: 1** on page 185 of the Learner's Book. Go through the exercise with learners. They describe the pattern and find a rule for the pattern.

**Review Exercise****Differentiated lesson****Low Ability Learners**

- Learners work in pairs to identify the rule.  
1) 10, 12, 14, \_\_\_\_ 2) 18, 16, 14, \_\_\_\_

**High Ability Learners**

- Working in pairs, learners continue the patterns and find rules for the patterns.  
1) 55, 57, 59, \_\_\_\_  
2) 38, 37, 35, \_\_\_\_

**Assessment for Learning**

Refer learners to Exercise 1 on page 189 of the Learner's Book.

**Suggested Home Work**

Find rules for these patterns and continue with the next 3 terms.

- 24, 26, 28, \_\_\_\_
- 12, 17, 22, \_\_\_\_
- 50, 60, 70, \_\_\_\_
- 65, 66, 67, \_\_\_\_

**Lesson 2:** Finding rules for subtraction patterns**Starter**

Learners recite the rhyme "Can you count 1, 2, 3"

**Find out**

Refer to **Find out: B** on page 187 of the Learner's Book. Learners work in pairs, study the pattern and continue with the next term. (**Critical thinking, collaborative learning**).

**Let Us Learn**

- Put learners into groups of five. Give these number pattern cards for learners to continue with the next 2 terms. They find rules for the patterns and justify their answers.

1) 67,65,63, \_\_\_\_\_

2) 93,88,83, \_\_\_\_\_

3) 76,66,56, \_\_\_\_\_

- Learners move round to compare their answers with that of their friends.  
**(Critical thinking, justification of ideas, collaborative learning)**
- Refer learners to **Let us learn: 2** on page 188 of the Learner's Book. Go through the exercise with them.

### Review Exercise

#### Differentiated lesson

##### Low Ability Learners

- Have learners work in pairs. They should continue with the next 2 terms and find rules for the patterns.
  - 60,50,40,.....
  - 30,25,20,.....

##### High Ability Learners

- Working in pairs, learners continue with the next 3 terms and find rules for the patterns.
  - 65, 60, 55,.....
  - 29, 27, 25,.....

#### Assessment for Learning

Refer learners to Exercise 2 on page 189 of the Learners Book.

#### Suggested Home Work

Find rules for these patterns and continue with the next 3 terms.

1) 100, 95, 90, \_\_\_\_\_

2) 60, 58, 56, \_\_\_\_\_

3) 20, 19, 18, \_\_\_\_\_

4) 33, 31, 29, \_\_\_\_\_

## Lesson 3: Finding rules for arrays of objects

#### Starter







Learners say the rhyme "Can you count 1, 2, 3?"

#### Find Out

Refer to **Find out: C** on page 187 of the Learners Book. Have learners work in groups,

using the object there to make their own patterns. **(Problem solving skills, critical thinking, collaborative learning)**

#### Let us Learn

- Make these patterns on the board.  
Learners should work in pairs.
  -  ,  , .
  -  ,  , .
- Ask learners to describe the rule for the patterns. The rule is triangle, square, circle for question 1. The second question is rhombus, rectangle, rhombus.
- Give out shapes of rectangles, triangles, circles and squares to learners in pairs. They make their own shape patterns. Learners move round the class to observe what others have done and appreciate their work. **(Critical thinking, collaborative learning)**
- Refer learners to **Let us learn: 3** on page 188 of the Learner's Book. Go through the activities in with them.

#### Review Exercise

- Give out four 2D shapes to learners individually. They form their own patterns and determine the rule for the patterns. They compare their patterns with others in their groups and explain their rules.

#### Assessment for Learning

Refer learners to Exercise 3 on page 190 of the Learner's Book.

#### Suggested Home Work

Use the four, 2D shapes to create by drawing 3 patterns of your own. Colour them.

For additional exercises on this module, refer to pages 115 - 118 of the Workbook.

Encourage learners to do the reflection exercises on page 191 after this sub-strand.

Learners complete the self-assessment table on page 192. This will help you know each learner's strength and weaknesses.

**3**

**Strand:**

**Geometry and  
measurement**

**Module 1:** 3D objects: recognising and naming 3D objects**Content Standard**

**B2.3.1.1:** Describe and analyse 2D shapes and 3D objects

**Indicator**

**B2.3.1.1.1:** Identify the common features or attributes of a collection of 3D objects (spheres, cylinders, cones, pyramids, cubes) of different dimensions or orientations.

**Learning Expectation**

Learners will be able to recognise and name 3D objects and describe 3D objects using their attributes.

**Essential for Learning**

Learners can identify 2D shapes and count in 1s up to 20.

**New Words**

Cylinder, cube, cuboid, cone, sphere, attribute, face, edge, corner, curved, flat, same, different.

**Resources**

Sheets of paper, cardboard, colour pencils, 3D objects, pictures of 3D objects, etc.

Number of Lessons **5**

**Lesson 1:** 3D Objects: Recognising and naming 3D objects**Starter**

Play "Count and write" (whole class or pair activity to practise counting and representing groups of objects with numerals).

Have learners put objects on their tables. alternatively, put some large objects on a table in front of the class. Learners count them together and then write the number in their notebooks.

The activity can be done in pairs, with one partner putting a group of objects on the table and the other partner counts them. Both partners write the number in their note books.

**Find Out**

Direct learners to page 194 of the Learner's Book.

**Say:** Look at the house. What shapes can you see? Where can you find some of these shapes? What is the colour of the shape you identify?

Do the different sizes and colours change the type of shape?

**Let us Learn**

- Direct learners to **Let us learn: 1** on page 194 of the Learner's Book. Point to the solid and drill the names with them.
- Put learners into small groups of about five or seven. Task them to identify objects in

the classroom and their homes which look like the 3D objects.

- Allow learners time to present their findings quickly to the class. (**Collaborative learning, problem solving**)
- Encourage other learners to ask questions for clarification.

**Review Exercise****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 page 196 of their Learner's Books.

**Lesson 2:** Attributes of a cube and a cuboid**Starter**

Show some 2D shapes to learners to mention their names.

**Let us learn**

- Use the learners' groups from the previous lesson.

- Give each group a cube and a cuboid and the following criteria to talk about the objects.

**Criteria**

- \* Name
- \* Roll/not roll
- \* Flat face/curved face
- \* Number of faces
- Task groups to make a presentation on their 3Ds to the class using the criteria. Encourage other learners to ask questions.
- Demonstrate how to cut the net of a cube and a cuboid.
- Task each group to cut the nets to make their own cubes and cuboids.  
*(Collaborative learning, problem solving)*
- Refer learners to **Let us learn: 2** and **Let us learn: 3** on page 195 of the Learners Book to identify the faces, corners and edges of the cube and cuboid.

**Review Exercise****Differentiated lesson****Low Ability Learners**

- Present learners with a cube and a cuboid and some criteria to describe them. Learners also identify objects that are considered cubes or cuboid in the environment.

**High Ability Learners**

- Task learners to identify 2D shapes found in a cube and cuboid and describe them using some given criteria.

**Assessment**

Refer learners to Exercise 2 on page 196 of the Learner's Book.

**Lesson 3: Attributes of a cylinder and a cone****Starter**

Show some 2D shapes to learners to mention their names.

**Let us learn**

- Use the groups from the previous lesson.
- Give each group a cylinder and a cone and some criteria by which to talk about the objects.

**Criteria**

- \* Name
- \* Roll/not roll

- \* Flat face/curved face
- \* Number of faces

- Task each group to make presentations on their objects to the class using the criteria. Encourage other learners to ask questions.
- Demonstrate how to cut the net of a cylinder and a cone.
- Task each group to cut the net to make their own cylinder and cone.  
*(Collaborative learning, problem solving)*
- Refer learners to **Let us learn: 2** and **Let us learn: 3** on page 195 of the Learners Book to identify the faces, corners and edges of the cylinder and cone.

**Review Exercise****Differentiated lesson****Low Ability Learners**

- Present learners with a cylinder and a cone and some criteria to describe them. Learners also identify objects that are considered cylinders and cones in the environment.

**High Ability Learners**

- Task learners to identify the 2D shapes found in a cylinder and a cone and describe them using some given criteria.

**Assessment for Learning**

Refer learners to Exercise 3 on page 197 of the Learner's Book.

**Lesson 4: Attributes of a sphere****Starter**

Show some 3D objects to learners to mention their names.

**Let us learn**

- Use groups from the previous lesson. Give each group a sphere and some criteria to talk about the object.

**Criteria**

- \* Name
- \* Roll/not roll
- \* Flat face/curved face
- \* Number of faces

- Task each group to make a presentation on their object to the class using the criteria. Encourage other learners to ask questions.  
*(Collaborative learning, problem solving)*
- Demonstrate how to cut the net of a sphere.



- Task each group to cut the net to make their own spheres.
- Refer learners to **Let us learn: 2** and **Let us learn: 3** on page 195 of the Learners Book to identify the faces, corners and edges of the sphere.

### Review Exercise

#### Differentiated lesson

##### Low Ability Learners

- Present learners with a sphere and some criteria to describe it. Learners also identify objects that are spherical in the environment.

##### High Ability Learners

- Task learners to identify the 2D shape found in a sphere and describe it using some given criteria.

#### Assessment for Learning:

Refer learners to Exercise 4 on page 198 of the Learner's Book.

## Lesson 5: Comparing 3D objects

### Starter

Learners say the rhyme "Can you count 1, 2, 3?"

#### Let us learn:

- Use the learners' groups from the previous lesson.
- Play a game of "shape hunt" where groups find 3D objects hidden in the class room by the teacher. Members of the group must describe the 3D objects they find using given attributes.
- Play a game of "blind fold" where a learner is blind-folded and given a 3D object to describe. Learners do so by just touching and using their experience of the sides of the 3D object to describe it.
- Task learners to draw at least two of the 3D objects and colour them nicely.

### Review Exercise

#### Differentiated lesson

##### Low Ability Learners

- Present learners with a 3D object to describe using some given criteria. Learners also draw a cone and a sphere.

#### High Ability Learners

- Learners, in blindfolds, differentiate between a cube and a cuboid. Learners also draw a cube and a cuboid.

#### Assessment for Learning

Refer learners to Exercise 5 on page 199 of the Learner's Book.

#### Suggested Homework

1. Draw and colour a cube and a cuboid.
2. Draw and colour two objects that have the shape of a sphere.
3. Write any two objects that have a rectangular shape.
4. Use these criteria to describe the following 3D objects

Criteria	Cone	Cylinder	Sphere
Corners			
Faces			
Roll/not roll			
Flat face /curved surface			

Criteria	Cuboid	Cube
Corners		
Faces		
Roll/not roll		
Flat face /curved surface		

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 120 - 121 of the Workbook

**Module 2:** Sorting 3D object**Content Standard**

**B2.3.1.1:** Describe and analyse 2D shapes and 3D objects.

**Indicator**

**B2.3.1.1.1:** Identify the common features or attributes of a collection of 3D objects (spheres, cylinders, cones, pyramids, cubes) of different dimensions or orientations.

**Learning Expectation**

Learners will be able to identify and sort 3D objects.

**Essential for Learning**

Learners can identify 3D objects and name them.

**New Words**

Cylinder, cube, cuboid, cone, sphere, attribute, face, edge, corner, curved, flat, same, different.

**Resources**

sheets of paper, colour pencil, cut out 3Ds, etc.

Number of Lessons **2**

**Lesson 1:** Sorting 3Ds by type**Starter**

Play "Five/ten more/less than"

Call out a number

Learners must call out a number that is 5 or 10 more/less than the number you called.

The aim of the game is to develop speed so move quickly from one number to the next.

**Find Out**

Direct learners to page 200 of the Learner's Book.

**Ask:** Can you identify the objects? What shape can you identify from the objects? What other objects can you name? What are the shapes in those objects?

**Let Us Learn**

- Put learners into groups of about five. Present each group with a picture/chart showing solid shapes of different colours and sizes.
- Task learners to sort the objects according to type, i.e. cones, cuboids, etc.
- Play "shape match". Put 3D objects on the floor. Give learners a sample of 3D objects to match with the right shape.
- Randomly select some learners in the class and give them sheets of paper on which different sizes and colours of 3D objects are drawn. Task them to sort them

by their types. (*Collaborative learning, critical thinking*)

- Refer learners to **Let us Learn** on page 200 of the Learner's book. Go through the exercises with them.

**Review Exercise**

- Task learners to sort groups of different 3D objects/shapes based on type.

**Assessment for Learning**

Refer learners to Exercise 1 on page 201 of the Learner's Book.

**Lesson 2:** Sorting 3Ds by colour**Starter**

Play "Five/ten more/less than"

Call out a number

Learners must call out a number that is 5 or 10 more/less than the number you called.

The aim of the game is to develop speed so move quickly from one number to the next.

**Let us learn**

- Use learners previous groups. Give each group a chart showing the different 3D objects in different colours. Task learners to sort the objects by their colours. (*Collaborative learning*)
- Play, "race to first". Put the class into two groups. Give learners cut-out names of 3D objects.

Learners are to draw the object of the name they picked.

- The one who finishes drawing the correct object wins. (**Collaborative learning, critical thinking**)

#### Review Exercise

- Give learners a sheet of paper with several 3D objects. Let them colour same shapes with the same colour.

#### Assessment for Learning

Refer learners to Exercise 2 on page 201 of the Learner's Book.

#### Suggested Homework

Draw three cylinders of different sizes and colour each with a different colour.

Draw a cube and a cuboid and colour same shape with the same colour.

For additional exercises on this module, refer to pages 122 - 123 of the Workbook

**Module 3:** Identifying 2D shapes**Content Standard**

**B2.3.1.1:** Describe and analyse 2D shapes and 3D objects.

**Indicator**

**B2.3.1.1.2:** Identify the common feature or attribute of a collection of 2D shapes (squares, triangles, rectangles, circles, pentagons and hexagons) or different dimensions or orientations.

**Learning Expectation**

Learners will be able to identify 2D shapes in 3D objects.

**Essential for Learning:**

Learners can identify 3D objects and name them.

**New Words**

Attribute, circle, triangle, rectangle, square, corners, sides, hexagon, pentagon.

**Resources**

Sheets of paper, colour pencil, cut out 2D shapes of, match box, Ludo die, 'chocomilo', coin etc.

Number of Lessons **2**

**Lesson 1:** Identifying 2D shapes (1)**Starter**

Play "Five (or ten) more/less than".

Call out a number. Learners must call out a number that is 5 or 10 more/less than the number you called.

The aim of the game is to develop speed so move quickly from one number to the next.

**Find Out**

Direct learners to page 202 of the Learner's Book.

**Ask:** What shapes can you identify in the shape robot? Can you draw any of them?

**Let us Learn**

- Direct learners to **Let us learn: 1** on page 202 of the Learner's Book. Drill the names of the plane shapes with the class, (circle, square, rectangle, triangle, hexagon, etc.)
- Put learners into groups of five or six. Task them to draw the 2D shapes. Lead the class to identify the shapes they have drawn.
- Using the same groups, task learners to identify objects in and around the class room and identify the 2D shapes in them.  
(*Collaborative learning, critical thinking*)

**Review Exercise****Differentiated lesson****Low Ability Learners**

- Task learners to draw and colour any 2D shape.

**High Ability Learners**

- Task learners to tell the 2D shape they see in a given 3D object. For example: what shape is the top of the teacher's table?

**Assessment for Learning**

Refer learners to Exercise 1 on page 205 of the Learner's Book.

**Lesson 2:** Identifying 2D shapes (2)**Starter**

Play "Five (or ten) more/less than".

Call out a number. Learners must call out a number that is 5 or 10 more/less than the number you called.

The aim of the game is to develop speed so move quickly from one number to the next.

**Let us learn**

- Use learners previous groups.
- Give each group a shape and some criteria to use to talk about the shape.  
**Criteria:**
  - \* Name
  - \* Number of sides
  - \* Type of face
  - \* Number of corners
- Have groups do presentations on their shapes to the class using the criteria.
- Encourage other learners to ask questions.  
(*Collaborative learning, Justification of ideas*)

- Task learners to use a combination of shapes to draw a shape robot.
- Refer to **Let us learn: 2** on page 204 of the Learner's Book. Go through the table with learners.

### Review Exercise

### Differentiated lesson

#### Low Ability Learners

- Present learners with a number of 2D shapes. They give the names, and number of sides and corners.

#### High Ability Learners

- Task learners to tell the number of sides and corners in a given number of shapes. E.g. How many sides are in 3 pentagons?

### Assessment for Learning

Refer learners to Exercise 2 on page 206 of the Learner's Book.

### Suggested Homework

1. Task learners to use paper cut-outs of various shapes and glue them on a piece of cardboard to make robot.
2. Draw a square and a triangle and tell the number of sides and corners in each shape.
3. How many sides are in three hexagons?
4. How many corners are in a rhombus?
5. Complete the table below.

Criteria	Hexagon	Square	Rectangle	Triangle	Circle	Rhombus
1. Number of Corners						
2. Number of sides						
3. Number of vertices						

For additional exercises on this module, refer to pages 124 - 126 of the Workbook.

**Module 4:** Sorting 2D shapes**Content Standard**

**B2.3.1.1:** Describe and analyse 2D shapes and 3D objects.

**Indicator**

**B2.3.1.1.3:** Create two-dimensional shapes based on given attributes, including number of sides and vertices.

**Learning Expectation**

Learners will be able to identify and sort 2D shapes.

**Essentials for Learning**

Learners can identify 2D shapes and name them.

**New Words**

Sort, side, irregular, regular, corner.

**Resources:** Sheets of papers, colour pencil, cut-out 2D shapes, etc.

Number of Lessons **2**

**Lesson 1:** Sorting 2D shapes by type**Starter**

Play “count and write” (whole class or pair activity to practise counting and representing groups of objects with numerals).

Have learners put objects on their tables or put some large objects on a table in front of the classroom.

Learners count them together and then write the number in their notebooks.

Activity can be done in pairs, with one partner putting a group of objects on the table and the other partner counting them. Both partners write the number in their notebooks.

**Find Out**

Direct learners to page 207 of the Learner's Book.

**Ask:** Can you identify and name the shape? What can you say about the sides?

**Let us Learn**

- Put learners into groups of six. Present each group with a picture/chart showing plane shapes of different colours and sizes.
- Task learners to sort out the shapes according to the type, i.e. triangles, rectangles, squares, circles, etc.
- Play “Shape match”. Put 2D shapes on the floor. Give learners a sample 2D shape to

match with the right shape. (*Collaborative learning, critical thinking, problem solving*)

- Refer learners to **Let us learn** on page 207 of the Learner's Book. Go through activity with learners.

**Review Exercise**

- Give learners several cut-out 2D shapes. Working in pairs, task them to sort the shapes according to their kind.

**Assessment for Learning**

Refer learners to Exercise 1 on page 208 of the Learner's Book.

**Lesson 2:** Sorting 2D shapes by colour**Starter**

Play “count and write” (whole class or pair activity to practise counting and representing groups of objects with numerals).

Have learners put objects on their tables or put some large objects on a table in front of the classroom.

Learners count them together and then write the number in their notebooks.

Activity can be done in pairs, with one partner putting a group of objects on the table and the other partner counting them. Both partners write the number in their notebooks.



**Let us learn**

- Use the learner's previous groups. Give each group a chart showing the different 2D shapes in different colours. Task learners to sort the shapes using colour.
- Play, "Race to first". Put class into two groups. Give each group cut-out 2D shapes in different colours. Task each group to sort the shapes by colour. The group that sorts out correctly first, wins. (**Collaborative learning, critical thinking**)

**Review Exercise**

- Give learners several cut-out 2D shapes with different colours. Working in pairs, task them to sort the shapes according to colours.

**Assessment for Learning**

Refer learners to page 209 of the Learner's Book for exercise.

**Suggested Homework**

1. Draw three hexagons of different sizes and colour each with a different colour.
2. Task learners to collect old newspapers and magazines and make cut-out shapes of the various 2D shapes.

For additional exercises on this module, refer to pages 127 - 128 of the Workbook.

**Module 5:** Identifying 2D shapes in everyday objects**Content Standard**

**B2.3.1.1:** Describe and analyse 2D shapes and 3D objects.

**Indicator**

**B2.3.1.1.3:** Create two-dimensional shapes based on given attributes, including number of sides and vertices.

**Learning Expectation**

Learners will be able to identify 2D shapes in everyday objects.

**Essential for Learning**

Learners can identify 2D shapes and name them.

**New Words**

Circle, triangle, rectangle, square

**Resources**

Sheets of paper, old newspapers, magazines, colour pencils, cut-out 2D shapes, match box, Ludo die, chocomilo cubes, coins, etc.

Number of Lessons **1**

**Lesson 1:** Identifying 2D shapes in everyday objects**Starter**

Play "Five (or ten) more/less than" (whole class activity for practising mental fluency with five or ten more than a number up to 50 or 100).

Call out a number. Learners must call out a number that is 5 or 10 more/less than the number you called.

The aim of the game is to develop speed so move quickly from one number to the next.

**Find Out**

Direct learners to page 210 of the Learner's Book

**Ask:** What shapes can you identify in the shape of the car? Can you draw any of them? Name any real object and identify the 2D shapes in it.

**Let us Learn**

- Direct learners to **Let us learn** on page 210 of the Learner's Book. Discuss the shapes in the objects.
- Put learners into groups. Present learners with objects such as coins, mathematical sets, chalk boxes, chocomilo cubes, etc. They identify the 2D shapes on the surface of each item and write the name down. Use the table below.

Objects	Coins	Mathematics set	Chalk box	Exercise book	Triangular set square
shape	e.g circle				

**Note:** Learners can trace the shapes.

- Present each group with newspapers and magazines. Task learners to look for images of objects and to identify the 2D shapes in those objects. (**Collaborative learning, problem solving**)
- Refer learners to **Let us learn** on page 210 of the Learner's Book. Go through the activities with them.

**Review Exercise****Differentiated lesson****Low Ability Learners**

- Task learners to write names of two objects and their corresponding 2D shapes.

**High Ability Learners**

- Give learners pictures of 5 real objects. Ask them to identify and draw the 2D shapes in them.

**Assessment for Learning**

Refer learners to page 211 of the Learner's Book for exercises.

**Suggested Homework**

Task learners to make records of objects they see in their community and write the names of 2D shapes they find in those objects in their exercise books.

For additional exercises on this module, refer to pages 129 -130 of the Workbook.

Encourage learners to do the reflection exercises on page 213 after this sub-strand.

Learners complete the self-assessment table on page 211. This will help you know each learner's strength and weaknesses.

**Module 1:** Different orientations of shapes**Content Standard**

**B2.3.2.1:** Demonstrate that the length of an object does not change with its placement or direction

**Indicator**

**B2.3.2.1.1:** Prove that the placement or direction of a shape or object does not change its length

**Learning Expectation**

Learners will be able to tell that two or more shapes are the same irrespective of their orientation/postion.

**Essential for Learning**

Learners can identify and name 2D shapes and 3D objects.

**New Words**

Triangle, square, rectangle, circle, different, position.

**Resources**

Water bottles, pencils, sticks, pictures of 2D shapes in different orientations.

Number of Lessons **2****Lesson 1:** Describing different orientations of shapes (1)**Starter**

Play "Count and write" (whole class or pair activity to practise counting and representing groups of objects with numerals).

Have learners put objects on their table or put some large objects on a table in front of the class. Learners count them together and then write the number in their notebooks.

Activity can be done in pairs, with one partner putting a group of objects on the table of the other partner. Both partners write the number in their note books.

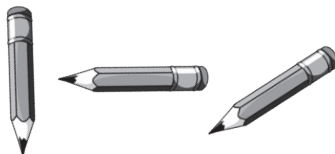
**Find Out**

Direct learners to page 214 of the Learner's Book.

**Ask:** Can you identify the items in the picture? Are the two bottles the same? Are they of the same height? Which one is longer/bigger?

**Let us learn**

- Using two straws/pencils of the same height, demonstrate to learners that the height of the straws are the same even in different orientations/positions.



- Direct learners to **Let us learn** on page 214 of the Learner's Book. Discuss the shapes by identifying those that are the same.
- Put learners into groups of five or seven. Present them with a drawing of different 2D shapes in different orientations. Task learners to identify all the given 2D shape that are the same. (**Collaborative learning, critical thinking**)

**Review Exercise****Differentiated lesson****Low Ability Learners**

- Give learners pencils and crayons of the same height. Task them to place same items in different positions and tell you what they can observe.

**High Ability Learners**

- Task learners to place objects in different positions and describe them.

**Assessment for Learning**

Refer learners to page 215 of the Learner's Book for exercise.

## Lesson 2: Describing different orientations of shapes (2)

### Starter

Play “Count and write” (whole class or pair activity to practise counting and representing groups of objects with numerals).

Have learners put objects on their table or put some large objects on a table in front of the class. Learners count them together and then write the number in their notebooks.

Activity can be done in pairs, with one partner putting a group of objects on the table of the other partner. Both partners write the number in their note books.

### Let us learn

- Use the learners’ previous groups.
- Revise learners knowledge on describing objects in different orientations.
- Task learners to draw a triangle in different orientations.
- Task learners to draw a rectangle in different orientations.
- Task learners to draw a square in different orientations.
- Ask each group to present their drawings to the class and explain them. They should tell the class whether the sizes/height changes or not when the same item is put in different positions. (**Collaborative learning**)

### Review Exercise

- Learners draw shapes in different orientations.

### Assessment for Learning

Refer learners to page 216 of the Learner’s Book for exercise.

### Suggested Homework

Draw two different 2D shapes in different orientations.

For additional exercises on this module, refer to pages 131 - 132 of the Workbook.

Encourage learners to do the reflection exercises on page 217 after this sub-strand.

Learners complete the self-assessment table on page 217. This will help you know each learner’s strength and weaknesses.

## Module 1: Measuring lengths

**Content Standard**

**B2.3.3.1:** Use non-standard units for measuring lengths, heights, mass and distance around objects

**Indicator**

**B2.3.3.1.1:** Demonstrate an understanding of how to measure lengths, capacities or mass - directly or indirectly - using non-standard units.

**Learning Expectation**

Learners will be able to measure the length of objects.

**Essential for Learning**

Learners can count by 1s and compare objects.

**New Words**

Hand span, foot length, non-standard.

**Resources:** Match sticks, pencils, paper clips, straws, colour pencils etc.

Number of Lessons **2**

## Lesson 1: Comparing length (1)

**Starter**

Play "Doubles" (whole class activity for developing mental fluency with doubles of 10). Call out a number between 1 and 10. Learners must call out the double of that number.

**Note:** The aim of the game is to develop speed so move quickly from one number to the next.

**Find Out**

Direct learners to **Find out** on page 218 of the Learner's Book.

**Ask:** Can you tell the difference in the two feet? Is there any other way we can measure them?

**Let us Learn**

- Direct learners to the **Let us learn** on page 218 of the Learner's Book. Discuss the activities in the pictures with them.  
Ask:  
What are the learners doing?  
What are they using to measure?  
What other items could they have used to measure?
- Put learners into groups of about five. Conduct a class vote for the groups to choose an item (match stick, paper clips, straw, pencil, etc.) for measuring. Task groups to go in turns to measure the length of the leg of the same table. Give learners time to present their results.

- Hold a whole class discussion on how many counts each group got.  
(*Collaborative learning*)

**Review Exercise****Differentiated lesson****Low Ability Learners**

- Learners measure the length of their tables with paper clips and record the number of counts.

**High Ability Learners**

- Task learners to measure the cupboard and the board. Let them write the object they used and the number of counts.

**Assessment for Learning**

Refer learners to page 219 of the Learner's Book for exercise.

## Lesson 2: Comparing length (2)

**Starter**

Play "Doubles" (whole class activity for developing mental fluency with doubles of 10). Call out a number between 1 and 10. Learners must call out the double of that number.

**Note:** The aim of the game is to develop speed so move quickly from one number to the next.



**Let us learn**

- Use the Learners groups from the previous lesson.
- Task them to measure the length of the front of the classroom using their foot length.
- Let them also measure the same length using their hand span and then a straw. Let them record their findings in a table like the one below.

hand span	foot span	straw

- Call out groups to present their results. Ask learners to select which item they would prefer to use to measure and give reasons for their answers. (**Collaborative learning, critical thinking**).

**Review Exercise****Differentiated lesson****Low Ability Learners**

- Learners tell how many pencils or match sticks will measure a given item. Example, the teachers table.

**High Ability Learners**

- Learners tell which item will be the best for measuring the length of the classroom and state why.

**Assessment for Learning**

Refer learners to page 220 of the Learner's Book for exercise.

**Suggested Homework**

1. Measure the length of your bed with a pencil and a straw and record your results in the table below.

Number of straws	Number of pencils

2. Learners measure items of their choice and record their results.

For additional exercises on this module, refer to pages 133 - 134 of the Workbook.

## Module 2: Measuring mass

**Content Standard**

**B2.3.3.1:** Use non-standard units for measuring lengths, heights, mass and distance around object.

**Indicator**

**B2.3.3.1.1:** Demonstrate an understanding of how to measure lengths, capacities or mass to directly or indirectly to using non-standard units.

**Learning Expectation:**

Learners will be able to compare and measure the mass of objects.

**Essential for Learning:**

Learners can count in 1s and compare and measure the length of objects.

**New Words**

Mass, measure, heavy, heavier, light, lighter, lightest.

**Resources**

Apples, pineapples, watermelons, books, pencils, etc.

Number of Lessons **2****Lesson 1:** Comparing the weight of objects (1)**Starter**

Play "Show me... but in different ways" (whole class activity for practising different ways of making or showing a number or quantity).

Raise up fingers (1 to 5 or 1 to 10) and say the number you are holding up.  
learners must hold up the same number of fingers, but using a different arrangement of fingers.

**Find Out**

Direct learners to **Find out** on page 221 of the Learner's Book.

**Ask:** Which of the two boys is heavier?

Why do you think he is heavier?

Expected answer: the boy in the green top.

Because he has caused the boy in red to go up.

**Let Us Learn**

- Put learners into groups of four.  
Direct learners to **Let us learn: 1** on pages 221 and 222 of the Learner's Book.
- Lead them to talk about the mass of the objects using the correct language. E.g. "the pineapple" is heavier than "the apple".
- Display an apple, watermelon, lime, pencil and straw on the table.

Task learners to pick the items in 2s, then compare and record which of the two items they think are heavier.

- Call out the groups to present their results and give reasons for their answers.  
**(Collaborative learning, Critical thinking)**
- Put pairs of items together and ask learners to tell which is heavier than, lighter than, or same as. Do this as a whole class activity.

**Review Exercise****Differentiated lesson****Low Ability Learners**

- Learners compare an orange and a pencil and tell which is heavier than or lighter than or the same as.

**High Ability Learners**

- Task learners to arrange given items from heaviest to lightest. Example, exercise book, pencil, apple, pineapple, etc.

**Assessment for Learning**

Refer learners to page 223 of the Learner's Book for exercise.

**Lesson 2:** Comparing the weight of  
objects (2)**Let us Learn:**

- Use the learners' groups from previous lesson.
- Display an apple, watermelon, lime, pencil and straw on the table.
- Task learners to compare and record which of the items they feel is heaviest and which is lightest.
- Call out each group to present and justify their results. (**Collaborative learning, Critical thinking**)
- Do a whole class activity. Task groups to go out of the class and pick five different items and order them according to their weight. Groups should present their results and justify their answers. (**Collaborative learning and Critical thinking**)

**Review Exercise****Differentiated lesson****Low Ability Learners**

Have learners order objects and tell which is heaviest and which is lightest.

**High Ability Learners**

- Tag items that look similar in shape but are different in weight and ask learners to order them.

**Assessment for Learning**

Refer learners to page 224 of the Learner's Book for exercise.

**Suggested Homework**

1. Write the names of five different pairs of items and identify which of each pair is heavier or lighter than the other.
2. Draw pairs of objects to show which is heavier and which is lighter.

Heavier	Lighter

For additional exercises on this module, refer to pages 135 - 136 of the Workbook

**Module 3:** Measuring capacity**Content Standard**

**B2.3.3.1:** Use non-standard units for measuring lengths, heights, mass and distance around objects

**Indicator**

**B2.3.3.1.:** Demonstrate an understanding of how to measure lengths, capacities or mass to directly or indirectly to using non-standard units

**Learning Expectation**

Learners will be able to compare and measure the volume of different containers.

**Essential for Learning:**

Learners can fill a bottle with water and compare the length and mass of objects.

**New Words**

Capacity, full, half-full, empty, more, less, most, least, lesser.

**Resources**

Empty containers of different sizes, cups, bottles, etc.

Number of Lessons **2****Lesson 1:** Comparing capacity (1)**Starter:**

Play: "Show me... but in different ways" (whole class activity for practising different ways of making or showing a number or quantity).

Raise up fingers (1 to 5 or 1 to 10) and say the number you are holding up.  
learners must hold up the same number of fingers, but using a different arrangement of fingers.

**Find Out**

Direct learners to **Find out** on page 225 of the Learner's Book.

**Ask:** What is the girl doing. What will happen if the girl pours all the water into the container? Why? Which of the containers holds more water?

**Let us Learn**

- Put learners into groups of about five.  
Display two containers of different sizes (capacity) in front of each group.  
Task learners to perform an activity to identify the container that holds more water (e.g. filling one container with water or sand and pouring it into the other).  
Call out the groups to present their results.
- Ask learners to select which container they would prefer to use to fill a bigger container

and why. (*Collaborative learning, Critical thinking*)

- Perform a whole class activity. Hold up or point to pairs of containers for learners to tell which of the two holds more.
- Direct learners to **Let us learn: 1** on page 225 of the Learner's Book. Go through the exercise with them.
- Guide them to compare things using the right expression.

**Review Exercise****Differentiated lesson****Low Ability Learners**

- Learners compare a milo tin and a bucket and tell which holds more or less.

**High Ability Learners**

- Task learners to arrange from the most to the least when they are given a number of containers to compare. Example, 1 litre bottle, a milo tin, a milk tin, a cup, a bowl, etc.

**Assessment for Learning**

Refer learners to Exercise 1 on page 226 of the Learner's Book.

**Lesson 2:** Comparing capacity (2)**Starter:**

Play: “Show me... but in different ways” (whole class activity for practising different ways of making or showing a number or quantity).

Raise up fingers (1 to 5 or 1 to 10) and say the number you are holding up.

learners must hold up the same number of fingers, but using a different arrangement of fingers.

**Let us learn**

- Put learners into two groups.
- Put pairs of same size of containers down. Fill the containers to different levels and ask learners to tell you which of the container has more water than the other.
- Change the position of the containers and ask learners to tell you which of the container has less water than the other.  
*(Collaborative learning, critical thinking, observation).*
- Refer learners to **Let us Learn: 2** on page 226 of the Learner’s Book. Go through the exercise with them.

**Review Exercise**

- Have learners order containers of different sizes from biggest to the smallest. Allow learners to fill the containers with water or sand to aid in the comparison.
- Have them identify which holds the most water and that which holds the least.

**Assessment for Learning**

Refer learners to Exercise 2 on page 227 of the Learner’s Book.

**Suggested Homework**

Draw pairs of containers to show which holds more and which holds less.

Holds more	Holds less

Write the names of two items under the following headings:

Holds less	Holds more
E.g. mug	Cooking pan

For additional exercises on this module, refer to pages 137 - 138 of the Workbook.

**Module 4:** Comparing three or more objects**Content Standard**

**B2.3.3.1:** Use non-standard units for measuring lengths, heights, mass and distance around objects

**Indicator**

**B2.3.3.1.2:** Develop an understanding of measuring as a process of comparing three or more items

**Learning Expectation**

Learners will be able to compare and measure the length of different objects.

**Essential for Learning**

Learners can compare the volume of two different containers.

**New Words**

smaller, smallest, longer, longest, bigger, biggest, heavier, heaviest.

**Resources**

Empty containers of different sizes, cups, bottles, pencils, straws, stones, etc.

Number of Lessons **1****Lesson 1:** Comparing three or more objects**Starter**

Play: "Show me... but in different ways" (whole class activity for practicing different ways of making or showing a number or quantity).

Raise up fingers (1 to 5 or 1 to 10) and say the number you are holding up.

Learners must hold up the same number of fingers, but using a different arrangement of fingers.

**Find Out**

Direct learners to **Find out** on page 228 of Learner's Book 2.

**Ask:** Which tree is the tallest?

**Let us Learn**

- Put learners into groups of about five. Give each group 3 sticks of different lengths, paper clips and bottle caps.
- Task them to measure each stick with either the paper clip or bottle caps and record the lengths.
- They should compare two sticks at a time and tell which one is shorter/longer than the other.
- Call out each group to present their findings to the class. (*Collaborative learning, critical thinking*)

- Direct learners to **Let us learn: 1** on page 228 of the Learners book. Go through the exercise with them.
- Refer learners to **Let us learn: 2** on page 229 of the Learner's Book. Go through the three different exercises with them.

**Review Exercise**

- Learners compare lengths, mass and capacity of different objects.  
Example, length of a pencil, crayon and an eraser.  
Mass of a stone, book and an orange.  
Capacity of bottle cap, bottle and a cup.

**Assessment for Learning**

Refer learners to Exercise 1 and 2 on pages 230 to 231 of the Learner's Book.

**Suggested Homework**

- Measure the length of your kitchen table, bed and chair with a pencil and record it.
- Select three objects in your home. Write them down. Compare the mass of the objects from heavy to heaviest.
- Choose three containers from your home, compare their capacities and record which holds more content to the one which holds less.

For additional exercises on this module, refer to pages 139 - 141 of the Workbook.



**Module 5:** Standard unit for measuring length**Content Standard**

**B2.3.3.2:** Use standard units to measure lengths, heights, mass and distance around objects.

**Indicator**

**B2.3.3.2.1:** Recognise the need for a standard unit of measurement for length.

**Learning Expectation**

Learners will be able to measure lengths of objects using standard units of measurement.

**Essential for Learning**

Learners can measure the length of objects using non-standard units.

**New Words**

Length, longer, shorter, standard unit.

**Resources**

Ruler, paper clips, straws.

Number of Lessons **2****Lesson 1:** Using standard unit for length (1)**Starter**

Play: "Show me... but in different ways" (whole class activity for practising different ways of making or showing a number or quantity).

Hold up fingers (1 to 5 or 1 to 10) and say the number you are holding up.

Learners hold raise up the same number of fingers, but using a different arrangement of fingers. (not the same fingers as you used)

**Find Out**

Direct learners to Find out on page 232 of the Learner's Book.

**Ask:** Can you identify the item in the picture? What is it used for? Why do we need such an item for measuring?

**Let us Learn**

- Put learners into groups of about five. Give each group a different item used in measuring. Example ruler, paper clips, etc.
- Task them to measure the length of the top of the teacher's table and record it (**Collaborative learning**).
- Write the result of each group on the board.

- Guide them to identify that because they used different items for measuring, the results differ from each group.
- Challenge groups to decide among themselves how they can arrive at the same results when they go back to measure the same thing. **Expect learners to tell you when they all use the same item to measure, they will get the same result.**
- Lead a whole class discussion on the importance of measuring with the same item. Challenge learners to tell how Learners in B2 and all the people in the world can get the same measure if they are all measuring the same length. (**Critical thinking**)
- Go through activities of **Let us Learn** on page 230 of the Learner's Book with learners.

**Review Exercise**

- Learners explain why we should measure objects/items using a standard unit.

**Assessment for Learning**

Refer learners to page 233 of the Learner's Book for exercise.

## Lesson 2: Using standard unit for length (2)

### Starter

Play: “Show me... but in different ways” (whole class activity for practising different ways of making or showing a number or quantity).

Hold up fingers (1 to 5 or 1 to 10) and say the number you are holding up.

Learners hold raise up the same number of fingers, but using a different arrangement of fingers. (not the same fingers as you used)

### Let us learn

- Put learners into groups of about five. Give each group a ruler.  
Task them to study the ruler carefully and identify its features. (**Collaborative learning**)
- Demonstrate how to use the ruler to measure.
- Give each group an item to measure. (Ensure that the items are of the same length to help identify the group that gets the measurement correct).  
Go round the groups to assist those who need help.
- Task learners in each group to measure the length of the top of the teachers table individually. Each person should record their length. (**Collaborative learning**)

- Let them go round and compare the lengths obtained by their friends. Those that have different lengths should re-measure to get the correct length.

### Review Exercise

- Learners measure and record the length of their exercise books, table legs, etc. They use a ruler.

### Assessment for Learning

Refer learners to page 234 of the Learner’s Book for exercise.

### Suggested Homework

1. Measure the length of your kitchen table or bed with a ruler.
2. Measure and draw a line for the following lengths; 10 cm, 8 cm and 15 cm.

For additional exercises on this module, refer to pages 142 - 143 of the Workbook.

**Module 6:** Reading the calendar**Content Standard**

**B2.3.3.3:** Develop an understanding of the measurement of time taken by events using arbitrary units and the hour.

**Indicator**

**B2.3.3.3.:** 1Read the calendar and solve problems involving the number of days in a week and number of months in a year.

**Learning Expectation**

Learners will be able to read dates and events on the calendar.

**Essential for Learning**

Learners can talk about the time it takes to complete simple events.

**New Words**

January, February, March, April, May, June, July, August, September, October, November, December

**Resources**

Calendar.

Number of Lessons **2**

**Lesson 1:** Reading the calendar  
(January - June)**Starter**

Play "Show me... but in different ways" (whole class activity for practicing different ways of making or showing a number or quantity).

Hold up fingers (1 to 5 or 1 to 10) and say the number you are holding up. Learners must hold up the same number of fingers, but using a different arrangement of the fingers.

**Find Out**

Direct learners to **Find out** on page 235 of the Learner's Book.

**Ask:** What is the diagram in the picture used for? What is it called? Where can you find one?

Brainstorm to come out with the name of the months. Teach the song about the days in each month: "Thirty days has September".

**Let us Learn**

- Show learners a calendar. In a whole class activity. Say and rehearse the names of the first six months repeatedly with the class.
- Put learners into groups and present each group with a calendar.  
Task learners to count the number of days in each of the first six months of the year.
- Demonstrate how to read the date on the calendar.

- Give groups a piece of paper with a date written on it.  
Task learners to read the date from the calendar by circling the day in the right month.
- Direct learners to **Let us Learn** on pages 235 and 236. Go through the notes and exercise with them.
- Ask learners who celebrate their birthdays between January and June. Let them tell the class their date of birth. Call another learner to circle the date mentioned on the Calendar.

**Review Exercise****Differentiated lesson****Low Ability Learners**

- Ask learners to count and tell you the number of days in the month of January.

**High Ability Learners**

- Circle a date on the calendar. Task learners to tell you the day and week of that particular month.

**Assessment for Learning**

Refer learners to Exercise 1 on page 237 of the Learner's Book.

## Lesson 2: Reading the calendar (July - December)

### Starter

Play “Show me... but in different ways” (whole class activity for practicing different ways of making or showing a number or quantity).

Hold up fingers (1 to 5 or 1 to 10) and say the number you are holding up. Learners must hold up the same number of fingers, but using a different arrangement of the fingers.

### Let us Learn

- Take learners through the names of the last six months of the year.  
Have learners repeat the names of the last six months over and over and again.
- Put learners into groups and present each group with a calendar.  
Task learners to count the number of days in each of the last six months of the year.  
Task learners to read the date from the calendar by circling the day in the right month.
- Lead the class to identify the dates for some of the yearly occasions like Christmas, Easter, ramadan, etc.
- Direct learners to the last part of **Let us learn** on page 236 of the Learner’s Book.  
Take them through the number of days in each month.

- Call a learner to mention the name of any month, another learner mentions another month that has the same number of days.

### Review Exercise

#### Differentiated lesson

##### Low Ability Learners

- Learners should identify the month they were born and circle the day on a calendar.

##### High Ability Learners

- Learners should write three special celebrations and identify the dates on the calendar.

#### Assessment for Learning

Refer learners to Exercise 2 on page 238 of the Learner’s Book.

#### Suggested home works

1. Write the number of days in each month.
2. Write the date of your mother’s or father’s or guardian’s birthday.
3. Write the names of the months of the year.

For additional exercises on this module, refer to pages 144 - 145 of the Workbook.

**Module 7:** Measuring time using arbitrary units**Content Standard**

**B2.3.3.3** Develop an understanding of the measurement of time taken by events using arbitrary units and the hour.

**Indicator**

**B2.3.3.3.2:** Use arbitrary units and hour on the clock to measure time to complete simple events.

**Learning Expectation**

Learners will be able to use arbitrary units to measure time.

**Essential for Learning**

Learners can talk about how long a simple event takes. e.g. bathing.

**New Words**

Seconds, minutes, hours, days, weeks, months, years

**Resources**

Clock

Number of Lessons **2**

**Lesson 1:** Measuring time using arbitrary units (1)**Starter**

Play "Doubles" (whole class activity for developing mental fluency with doubles of 10). Call out a number between 1 and 10. Learners must call out the double of that number.

**Note:** The aim of the game is to develop speed so move quickly from one number to the next.

**Find Out**

Direct learners to **Find out** on page 239 of the Learner's Book.

**Ask:** Look closely at the object in the picture. What is it used for?

Take feedback from learners. Let them know that it is used in checking how long an event takes.

**Let us Learn**

- Engage learners in a discussion on some of the activities they perform at home and in school, e.g. sweeping, brushing of teeth, bathing, eating, writing exercises and doing Homework, praying, etc.
- Call out some learners to role-play some of the activities.

- Ask learners to look at the activities closely and to estimate the time it takes to complete the activities.
- Learners to tell which activity takes more time than the other. (**Collaborative learning**)
- Discuss with learners the importance of time.
- Refer learner's to **Let us learn** on page 239 and 240 of the Learner's Book. Go through the exercise with them.

**Review Exercise****Differentiated lesson****Low Ability Learners**

- Learners name some activities and the estimated time it takes to complete the activities. Example, bathing, eating, brushing the teeth, etc.

**High Ability Learners**

- Learners name some activities and tell which activity would take a longer time than the other.

**Assessment for Learning**

Refer learners to Exercise 1 on page 240 of the Learner's Book.

## Lesson 2: Measuring time using arbitrary units (2)

### Starter

Play “Doubles” (whole class activity for developing mental fluency with doubles of 10). Call out a number between 1 and 10. Learners must call out the double of that number.

**Note:** The aim of the game is to develop speed so move quickly from one number to the next.

### Let us Learn

- Put learners into groups of about five. Present them with activity sheets to complete. Have them estimate how much time it takes to complete the following.

Activity	Time it takes
1. Time it takes to be in school.	It takes about ..... to stay in school.
2. Time it takes to wash a dress.	It takes about ..... to wash a dress.
3. Time it takes to brush teeth.	It takes about ..... to brush teeth.
4. Time it takes to bath.	It takes about ..... to bath.
5. Time it takes to sweep the classroom.	It takes about .....to sweep the classroom.

- Allow learners to present their table to the whole class. Learners must give reasons for their answers. (**Collaborative learning, problem solving**)
- Note:** Accept any time they give, except when it is too outrageous.

### Review Exercise

#### Differentiated lesson

##### Low Ability Learners

- Learners name some activities and the estimated time it takes to complete the activities.

##### High Ability Learners

- Learners name some activities and tell which activity takes a longer time than the other.

#### Assessment for Learning

Refer learners to page 241 of the Learner's Book for exercise.

#### Suggested Homework

Learners complete the table below.

Activity	Time it takes
1. Time it takes to eat breakfast.	
2. Time it takes to walk from home to school.	
3. Time it takes to do Homework.	
4. Time it takes to sing a song.	
5. Time it takes to walk from the classroom to the canteen.	

For additional exercises on this module, refer to pages 146 - 147 of the Workbook.



**Module 8:** Relationship between units of time**Content Standard**

**B2.3.3.3:** Develop an understanding of the measurement of time taken by events using arbitrary units and the hour.

**Indicator****B2.3.3.3.2:**

Use arbitrary units and hour on the clock to measure time to complete simple events.

**Learning Expectation**

Learners will be able to explain the relationship between the units of time.

**Essential for Learning**

Learners can talk about the time it takes to complete simple events.

**New Words**

Seconds, minutes, hours, days, weeks, months, years.

**Resources**

Clock (with second, minute and hour hands).

Number of Lessons **4**

**Lesson 1:** Relationship between units of time (1)**Starter**

Play "Show me... but in different ways" (whole class activity for practising different ways of making or showing a number or quantity).

**Starter Activity**

Hold up fingers (1 to 5 or 1 to 10) and say the number you are holding up.

Learner's must hold up the same number of fingers, but using a different arrangement of the fingers.

**Find Out**

Direct learners to **Find out** on page 242 of the Learner's Book.

**Ask:** Can you identify the object in picture A? What is it used for?

What does each hand do?

**Let us Learn**

- Put learners into groups and present each group with a clock.
- Task each group to study the clock carefully to see how the movement of the hands work in connection with the others.
- Call groups to tell the class what they observed. Discuss the function of each hand with the class.
- Also, discuss the numbers on the clock and what they stand for.
- Refer learners to **Let us Learn: 1** on page 242 of the Learner's Book. Go through the activity with them.

**Review Exercise****Differentiated lesson****Low Ability Learners**

- Learners identify some of the features of the clock.

**High Ability Learners**

- Learners tell how the hands of a clock affect each other.

**Assessment for Learning**

Refer learners to Exercise 1 on page 245 of the Learner's Book.

**Lesson 2:** Relationship between units of time (2)**Starter**

Play "Doubles" (whole class activity for developing mental fluency with doubles of 10).

Call out a number between 1 and 10

Learners must call out the double of that number.

**Let us Learn**

- Revise the previous lesson on the features of the clock with learners.
- Demonstrate how to read the clock. Engage the whole class to read different times on the clock.
- Put learners into groups. Present them with clock faces on sheets of paper and task them to read the time and record it.

- Allow groups time to present their results.
- Refer learners to the examples in **Let us Learn: 1** on page 243 of the Learner's Book. Go through with learners.

### Review Exercise

#### Differentiated lesson

##### Low Ability Learners

- Give learners two different clock faces. Learners tell the time on the clock faces and record them.

##### High Ability Learners

- Learners tell the time when told verbally the position of the hour and minute hands. Example, the hour hand is on 6 and the minute hand is on 12.

#### Assessment for learning

Refer learners to Exercise 2 on pages 245 and 246 of the Learner's Book.

## Lesson 3: Relationship between units of time (3)

### Starter

Play "Doubles" (whole class activity for developing mental fluency with doubles of 10). Call out a number between 1 and 10. Learners must call out the double of that number.

### Let us Learn

- Revise the previous lesson on telling the time with learners.
- Use the learners' groups from the previous lesson. Present each group with a clock face.
- Let them move the minute hand to 6. Explain to learners that, anytime the minute hand points to 6, it is half past.
- Now let learners move the hour hand and point it in the middle of two numbers on the clock face. Example 2 and 3. Let them know that the time will be half past the first number (2). So the time is half past 2.
- Task learners to show these times on their clock faces. Half past 4, half past 12, etc.

- Ask learners to move the minute hand to 3 and hour hand a little after 12. Explain to them that when the minute hand is on 3, the time is quarter past the number close to the hour hand. So the time is quarter past 12.
- Give learners the following to show on the clock face. Quarter past 4, quarter past 6, etc.
- In the same way, when the minute hand is on 9 and the hour hand is almost closer to a number, we say its quarter to that number.
- Refer learners to **Let us learn: 2** on pages 243 and 245. Go through the notes/exercise with them.

### Review Exercise

#### Differentiated lesson

##### Low Ability Learners

- Learners show these times on the clock face. Half past 9, half past 3, half past 12 and half past 6. Let them work in pairs.

##### High Ability Learners

- Learners draw two clock faces to show quarter to 3 and quarter past 3.

#### Assessment for learning

Refer learners to EWxercise 3 on page 246 of the Learner's Book.

## Lesson 4: Time, days, weeks, months and years

### Starter

Show them a clock face and learners mention the time.

### Let us learn

- Use the learners' groups from the previous lesson.
- Direct learners to **Let us learn: 3** on page 244 of the Learner's Book. Discuss the relationships between the units of time: seconds, minutes and hour with them.
- Play "It's a match". Give learners cards showing various units of time.

- Show a unit e.g. 60 seconds. Learners hold up a card showing 1 minute on it.
- Discuss the relationships between the units of time: days, weeks and month with them.

7 days make 1 week
--------------------

4 weeks make 1 month
----------------------

12 months make 1 year
-----------------------

- Play “Its’ a match”. Give learners cards showing various units of time.
- Show a unit, e.g. 1 week. learners hold up a card showing 7 days.

### Review Exercise

#### Differentiated lesson

##### Low Ability Learners

- Task learners to answer the following. How many minutes make 1 hour. How many seconds make 1 minute and how many days make 1 week.

##### High Ability Learners

- Learners explain the relationship between time units when they are doubled.  
E.g. how many minutes make two hours?  
E.g. How many days make two weeks?

#### Assessment for learning

Refer learners to Exercise 4 and 5 on page 247 of the Learner’s Book.

### Suggested Homework

1. Draw clock faces showing the following time.

<b>3:15</b>	<b>8:00</b>
<b>6:30</b>	<b>7:45</b>

2. Complete the table.

60 seconds make.....minutes
60 minutes make.....hour
24 hours make.....day
7 days make..... week
4 weeks make.....month
12 months make..... year

For additional exercises on this module, refer to pages 148 - 152 of the Workbook.

Encourage learners to do the reflection exercises on page 248 after this sub-strand.

Learners complete the self-assessment table on page 250. This will help you know each learner’s strength and weaknesses.

**4**

**Strand:**

**Data**

**Module 1:** Collecting and organising data**Content standard**

**B2.4.1.1:** Collect and record data about self and others and use it to answer and pose questions.

**Indicator**

**B2.4.1.1.1:** Use tallies, checkmarks, charts, lists or objects to collect and organise data to answer and pose questions about themselves, others, or surroundings

**Learning Expectation**

Learners will be able to collect, sort and organise data and find how many for each category.

**Essentials for Learning**

Learners can group objects based on a given criteria and write the numeral for each category.

**New words**

Data, collect, tally.

**Resources**

Bottle caps of different colours, empty water bottles, containers., four 2D shapes in different colours.

Number of Lessons **2**

**Lesson 1:** Collecting data (objects)**Starter**

Learners sing the song "Prentoa Baako".

**Find Out**

Refer learners to page 252 of the Learners' Book. Learners identify the different shapes there, count them and write the number for each category.

**Let us Learn**

- Write the following subjects on the board and let learners show by hand which subject they like best, and state why.  
Our World Our People (OWOP) -  
Mathematics -  
English -  
French -
- Refer learners to **Let us learn: 1** on page 252 of the Learner's Book. They count the different drinks and write the total number for each brand. (*Critical thinking, collaborative learning, justification of ideas*).

**Review Exercise**

Write these games on the board. Have learners determine the game they like best and make a stroke against it.

Football

Ampe

Netball

Ludo

(*Personal development*)

**Assessment for Learning**

Refer learners to Exercise 1 on page 255 of the Learner's Book.

**Suggested Homework**

Count the number of the following items in your house. spoons, bowls, cups, knives. Write down the number for each. Learners discuss in class the next day.

**Lesson 2:** Collecting data (tally)**Starter**

Learners sing the song “A circle is a shape”.

**Let Us Learn**

- Write the following colours on the board. Have learners select the colour they like best and tally it.
- They mark the tally and write the number.

Colour	Tally	Number
Red		
Blue		
Green		
Yellow		

*(personal development)*

- Refer to **Let us learn: 2** on page 253 and 254 of the Learner’s Book. Go through the exercise with them.

**Review Exercise**

Learners in groups of five tell the fruit they like best and record it on the tally sheet.

**Assessment for Learning**

Refer learners to Exercise 2 on page 256 of the Learner’s Book.

**Suggested Homework**

Put a tally against the types of people in your house.

Type of people	Tally	Number
Male		
Female		
Children		

For additional exercises on this module, refer to pages 154 - 156 of the Workbook.



**Module 2:** Concrete graphs and pictographs**Content standard:**

**B2.4.1.2:** Construct and interpret concrete graphs and pictographs.

**Indicator:**

**B2.4.1.2.1:** Draw and interpret concrete graphs and pictographs.

**Learning Expectation**

Learners will be able to interpret pictographs and concrete graphs and answer questions about them.

**Essentials for Learning**

Learners can collect data by tallying.

**New words**

Pictograph, graph, concrete.

**Resources**

Bottle caps, pictures of animals, masking tape, pictures of people and fruits.

Number of Lessons **2****Lesson 1:** Interpretation of graphs(1)**Starter**





Learners sing "I'm counting one".

**Find Out**

Refer learners to page 257 of the Learner's Book. Working in groups of five, Learners count and find out the number of pencils for each person in the graph.

**Let us Learn**

- Hand out cut-out pictures of fruits (mango, orange, pawpaw and apple) to learners. Draw the fruits on the board in a table, like the one shown below. Have learners identify the fruit they like best. They use masking tape to stick the cut-out fruits against the fruits selected.

Fruits	Number
	
	
	
	

- Learners working amongst themselves, ask questions to determine which is the most popular fruit among learners. They identify the one that most learners like and the one that is liked the least.

- Refer learners to **Let us learn: 1** on pages 257 and 258 of the Learner's Book. Go through the activities with them.

**Review Exercise**

Learners work in groups of five. Give each group a table. Learners answer questions based on that, like the one below.

People in a school	Number
Female teachers	8
Male Teachers	6
Girls in Basic 2	19
Boys in Basic 2	15

- Which group has more people? \_\_\_\_\_
- Which group has fewer people? \_\_\_\_\_
- By how many are male teachers more or less than female teachers? \_\_\_\_\_

**(critical thinking, collaborative learning)**

**Assessment for Learning**

Refer learners to Exercise 1 on page 260 of the Learner's Book.

**Suggested Homework**

Count the number for each category of objects in your house. Learners discuss their results in class the next day.

Objects made of wood \_\_\_\_\_.

Objects made of metal \_\_\_\_\_.

Objects made of plastic \_\_\_\_\_.

**(Personal development)**

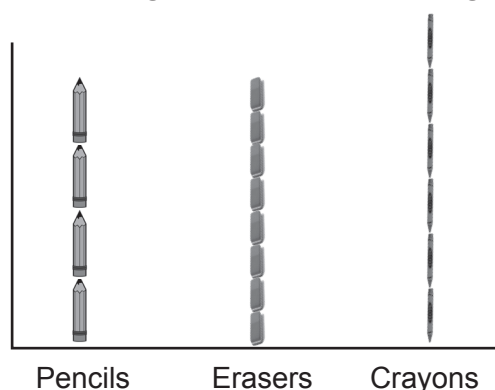
## Lesson 2: Interpretation of graphs (2)

### Starter

Learners sing the song: “One, two, buckle my shoe”.

### Let Us Learn

- Put learners into groups of five. Give each group 4 pencils, 8 erasers, and 6 crayons.
- They arrange them vertically to form a graph. Learners compare their graphs.  
*(critical thinking, collaborative learning)*



- Learners ask themselves questions:  
How many pencils are there?  
How many more erasers are there than crayons?
- Give learners the following cut-out shapes to arrange in a form of graph: 5 triangles, 8 squares and 11 rectangles.

- Learners ask questions in their groups and compare their answers with other groups.  
How many shapes are there?  
Which shapes are more?  
How many more rectangles are there than triangles?
- Refer learners to Let us learn: 2 on pages 258 and 259 of the Learner's Book. Take them through the exercise.

### Review Exercise

Give learners bottle caps in different colours and quantities. In groups of five, they make a concrete graph to represent the number of caps they have for each colour.

Learners use their graph to answer the following questions.

How many red bottle caps are there?  
How many fewer white caps are there than red caps?

How many bottle caps are there in total?

### Assessment for Learning

Refer learners to Exercise 2 on pages 261 and 262 of the Learner's Book.

For additional exercises on this module, refer to pages 157 - 161 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 264. This will help you know each learner's strength and weaknesses.

**Strand 1: Number**

**Sub Strand 1:** Number: Counting, representation, cardinality and ordinality

**Module 1: Number names**
**Exercise 1** page 14

1. 11 Eleven
2. 13 Thirteen
3. 16 Sixteen
4. 19 Nineteen

**Exercise 2** page 15

1. Eighty five
2. Forty nine
3. Sixty nine
4. Ninety six
5. One hundred

**Exercise 3**

746 – Seven hundred and forty six  
 164 – One hundred and sixty four  
 823 – Eight hundred and twenty three  
 291 – Two hundred and ninety one  
 912 – Nine hundred and twelve

**Module 2: Counting sequence**
**Exercise 1** page 18

1. 6      8      12
2. 2      6      10
3. 14    16    20
4. 50    52    54      56      58      60
5. 30    32    34      36      38      40
6. 47    49    51      53      55      57

**Exercise 2** page 19

1. 16    14    10      8
2. 10    8      6      4      2      0
3. 60    56    52      48
4. 42    40    38      34
5. 38    36    34      32      30      28
6. 98    96    94      92      90      88
7. 52    50    48      46      44      42

**Exercise 3** page 20

1. 105              115      125      130      140      145  
     155              160      170

**Exercise 4** page 21

1. 495    490      480      475
2. 340    335      330      320
3. 405    400      395      380

4. 220              210      200      195
5. 140              135      125      120
6. 295              280      275      270
7. 450              445      440      430      425

**Exercise 5** page 22

1. 30      50      80
2. 110    130    140
3. 530    550    570
4. 860    890    900
5. 950    960    980      1000

**Exercise 6** page 23

1. 220      200      180
2. 490      470      450
3. 692      682      672      662
4. 990      980      970      960
5. 900      890      880      870

**Module 3: Counting to find “how many”.**
**Exercise 1** page 26

1. a. 14  
b. 28
2. a. 18  
b. 36
3. a. 26  
b. 52
4. a. 20  
b. 40

**Exercise 2** page 27

1. 150
2. 90

**Exercise 3** page 28

1. 80
2. 150

**Module 4: Representing quantities with numerals.**
**Exercise 1** page 31

1. 24
2. 132
3. 20
4. 40
5. 140
6. 115

**Exercise 2** page 32

1. 217
2. 533
3. 660
4. 999
5. 1000

**Module 5: Estimating quantities.**
**Exercise 1** page 35

1. estimate 20 actual 22
2. estimate 40 actual 37
3. estimate 10 actual 11
4. 80

Check on learners answers for the estimates.

**Module 6: Describing the position of numbers.**
**Exercise 1** page 38

1. a. 543 b. 158 and 917  
c. 293 and 46 d. 666
2. a. left of b. above  
c. below d. left of

**Module 7: Using non-standard units for measuring (1)**
**Exercise 1** page 41

To be done by learners.

**Exercise 2** page 42

1. a. 6 arm spans or 7 and half paces  
b. arm span.
2. a. 2 arm spans or 12 hand spans  
b. hand span.

**Module 8: Using non-standard units for measuring (2)**
**Exercise 1** page 44

Learners to do this.

**Module 9: Place value**
**Exercise 1** page 47

1. 5 tens 2 ones
2. 6 tens 5 ones
3. 4 tens 1 ones
4. a. tens b. eighty
5. a. hundreds b. six hundred
6. a. ones b. six

**Exercise 2** page 48

	hundreds	tens	ones
1.	3	4	8
2.	5	7	4
3.	8	9	2
4.	9	9	9

5. 8 6. 4 7. 0
8. 1 9. 9 10. 2

**Module 10: Partitioning of whole numbers**
**Exercise 1** page 51

1. 60 4
2. 80 2
3. 400 90 8
4. 42
5. 35
6.  $52 \rightarrow 50+2$ ; or  $40+12$ ; or  $30+22$ ; or  $20+32$
7.  $63 \rightarrow 60+3$ ; or  $50+13$ ; or  $40+23$ ; or  $30+33$
8.  $56 \rightarrow 50+6$ ; or  $40+16$ ; or  $30+26$ ; or  $20+36$
9.  $83 \rightarrow 80+3$ ; or  $70+13$ ; or  $60+23$ ; or  $50+33$

**Exercise 2** page 52

1. 513 500 + 10 + 3
2. 926 900 + 20 + 6
3. 807 800 + 0 + 7
4.  $457 = 400 + 50 + 7$
5.  $685 = 600 + 80 + 5$
6.  $185 = 100+85$ ;  $100+80+5$ ;  $90+70+25$
7.  $326 = 300+20+6$ ;  $200+100+20+6$ ;  $250+70+6$
8.  $654 = 600+50+4$ ;  $500+150+4$ ;  $454+120+80$

Check on other different ways of learners answers.

**Module 11: Describing numbers in equivalent ways.**
**Exercise 1** page 55

1. 63 and 61 63 is little more than 61.
2. 49 and 94 49 is a lot less than 94.
3. 52 and 55 52 is a little less than 55.
4. 333 and 335 333 is a little less than 335.
5. 234 and 865 234 is a lot less than 865.

Check on other different ways of learners answers.

**Exercise 2** page 55

Complete the following.

1. less
2. more
3. less
4. less
5. more

**Module 12: Arranging objects in different ways.**
**Exercise 1** page 59

1. Learners to do these.
2. Learners to do these.
3. 7 groups 8 pebbles 56 pebbles

## ANSWERS

### Exercise 2 page 60

- 8 groups 5 pebbles 3 left over  
43 pebbles
- 9 groups 3 pebbles none 27 pebbles

### Module 13: Comparing whole numbers using the symbol $>$ , $<$ or $=$

#### Exercise 1 page 62

- $>$
- $>$
- $=$
- Any number less than 72
- Any number greater than 24
- Check on learners answer
- Any number greater than 45
- Any number greater than 65
- Check on learners answers

#### Exercise 2 page 62

- 89 ; 78
- 20 ; 50
- 42 ; 63
- 75 ; 39
- $66 < 84$
- $74 > 47$
- $39 < 86$
- $56 < 89$

### Module 14: Ordering whole numbers

#### Exercise 1 page 64

- a. 18 b. 19 c. 21 d. 15 e. 18 f. 15
- a. 13 b. 14 c. 12 d. 10 e. 11 f. 12  
g. 29 h. 26 i. 35

#### Exercise 2 page 65

- 22 30 63 72 75
- 25 28 65 83 90
- 98 87 70 30 25
- 81 76 72 65 36
- 29 46 50 63 71 79
- 97 90 83 65 28 25

### Module 15: Finding missing numbers

#### Exercise 1 page 68

- 28 30 34 38
- 50 65 70 80
- 30 60 80 90
- 58 59 62 63

- 30 40 50 60 70 80
- 40 50 60 70 80 90
- 15 25 35 55 65 75
- 33 43 63 73 83 93

#### Exercise 2 page 69

- |    |    |    |    |     |    |
|----|----|----|----|-----|----|
| 2  | 3  | 4  | 7  | 8   |    |
| 11 | 13 | 15 | 16 | 18  | 19 |
| 20 | 21 | 23 | 25 | 26  | 28 |
| 30 | 33 | 34 | 37 | 39  | 40 |
| 41 | 42 | 44 | 45 | 46  | 47 |
| 49 | 52 | 53 | 55 | 56  | 58 |
| 61 | 63 | 64 | 67 | 69  | 70 |
| 71 | 72 | 76 | 77 | 79  | 80 |
| 82 | 84 | 86 | 88 | 89  | 91 |
| 94 | 95 | 97 | 98 | 100 |    |
- |    |    |    |    |
|----|----|----|----|
| 22 | 23 | 24 | 25 |
| 31 | 33 | 34 | 35 |
- |    |    |    |    |
|----|----|----|----|
| 15 | 16 | 17 | 18 |
| 25 | 26 | 27 | 29 |

### Module 16: Word Problems Involving comparison.

#### Exercise 1 page 71

- a. Fatima b. Amavi
- a. B b. A
- a. Antwi b. Kwame
- a. Dela b. Dede

#### Exercise 2 page 72

- more 42 ; 50
- 86 is bigger  
37 is less

#### Reflection Exercise 1 page 73

- Match
 

9 → nine	60 → sixty
15 → fifteen	30 → thirty
- 16 18
- 58 56
- 30 35
- 35 40
- 90 70
- 60 90
- 313
- 433
- a. Tens b. Ninety
- Hundreds b. Four hundred
- Ones b. Five

#### Reflection Exercise 2 page 74

- 252
- 84
- $252 = 200 + 50 + 2$
- $84 = 80 + 4$
- $843 = 800 + 40 + 3$
- $=$
- $>$
- $<$
- $>$
- $=$

10. 20   11. 88   12. 52   13. 34   14. 15

Learners to do these.

15. a. Mamle                      b. 58

### Strand 1: Numbers

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

#### Module 1: Addition of whole numbers

##### Exercise 1                      page 77

1. ✓
2. ✓
3. ✓
4. ✓
5. 12                      6. 33
7. 20                      8. 15

##### Exercise 2                      page 78

1. 32
2. 31
3. 23
4. 14
5. 18;30
- 6 – 9 Check on learners answers

#### Module 2: Adding or subtracting zero

##### Exercise 1                      page 81

1. 14
2.  $18 + 0 = 18$
3.  $17 + 0 = 17$
4. 14                      5. 16                      6. 26
7. 43                      8. 19                      9. 88

#### Module 3 Finding missing numbers

##### Exercise 1                      page 84

Find the missing addend.

1. 11                      2. 42
3. 23                      4. 29
5. 26
6.  $56 - 22 = \boxed{34};$  34 apples are red
7.  $45 + \boxed{\phantom{00}} = 69$   
 $\boxed{\phantom{00}} = 24;$  he added 24 more cola nuts.
8.  $38 + \boxed{\phantom{00}} = 82$   
 $\boxed{\phantom{00}} = 44;$  he got 44 snails on the second day.

##### Exercise 2                      page 85

1. 28                      2. 59
3. 68                      4. 50
5. 29                      6. 12

##### Exercise 3                      page 85

1. 62                      2. 63
3. 95                      4. 72
5. 100                      6. 65

#### Module 4: Word Problems addition and subtraction

##### Exercise 1                      page 89

Learners to do these.

##### Exercise 2                      page 90

Learners to do these.

#### Module 5: Addition and subtraction of whole numbers using “= and ≠” signs

##### Exercise 1                      page 93

1. =                      2. ≠
3. ≠                      4. =
5. =                      6. =
7. =                      8. =

##### Exercise 2

1. ≠                      2. =
3. =                      4. ≠
5. =                      6. ≠
7. ≠                      8. =

#### Module 6: Relationship between addition and subtraction.

##### Exercise 1                      page 95

1. 16                      2. 15
3. 6                      4. 8
5. 7                      6. 5

##### Exercise 2                      page 96

1. 23                      2. 18  
 $23 + 5 = 28$                        $18 + 28 = 46$   
or  $5 + 23 = 28$                       or  $28 + 18 = 46$
3. 29                      4. 43  
 $29 + 6 = 35$                        $43 + 14 = 57$   
or  $6 + 29 = 35$                       or  $14 + 43 = 57$
5. 51  
 $51 + 47 = 98$   
or  $47 + 51 = 98$



# ANSWERS

## Module 7: Addition and subtraction facts (fluency 1)

### Exercise 1 page 98

1. 

	21	
30	31	32
	41	
2. 

55	56	57	58
65			
75			
85			
3. 

1	2	3
		13
		23
		33
42	43	
4. 

			35	
42	43	44	45	
			55	
			65	66
			75	

### Exercise 2 page 99

1. Before: 10    40    80    20    50  
After: 30    60    100    40    70
2. Before: 39    53    42    24    16  
After: 59    73    62    44    36
3. Before: 24    37    50    68    12  
After: 26    39    52    70    14
4. Before: 36    69    11    67    49  
After: 38    71    13    69    51
5. Before: 38    23    51    25    13  
After: 40    25    53    27    15

## Module 8: Double of number (1 – 12)

### Exercise 1 page 101

1. double these numbers.
  - a. double 1 = 2
  - b. double 6 = 12
  - c. double 7 = 14
  - d. double 5 = 10

2.	Number	Double
	2	$2 + 2 = 4$
	3	$3 + 3 = 6$
	4	$4 + 4 = 8$
	8	$8 + 8 = 16$
	6	$6 + 6 = 12$
	9	$9 + 9 = 18$

## Module 9: Addition and subtraction facts (fluency 2)

### Exercise 1 page 104

1. 10    10
2. 10    10
3. 10    10
4. 10    10
5. 10
6. 10    10

### Exercise 2 page 105

1. 8    8 + 7
2. 6    9 + 6
3. 7    7 + 8
4. 9    10 + 9 = 19
5. 10    9    10 + 9
6. 11    8 + 11 = 19
7. 14    6 + 14
8. 7    7 + 13
9. 10    10 + 10

## Module 10: Addition and subtraction facts (fluency 3)

### Exercise 1 page 108

Make a 10 to add

1. 15     $8 + 2 + 5 = 15$
2. 14     $9 + 1 + 4 = 14$
3. 17     $7 + 1 + 9 = 17$
4. 14     $7 + 3 + 4 = 14$      $10 + 4 = 14$
5. 14     $4 + 4 + 2 = 14$      $4 + 10 = 14$

### Exercise 2 page 109

1.  $8 + 8 + 1 = 17$
2.  $4 + 4 + 1 = 9$
3.  $9 + 9 + 1 = 19$
4.  $6 + 6 + 1 = 13$
5.  $5 + 5 + 1 = 11$
6.  $3 + 3 + 1 = 7$

### Exercise 3 page 110

1.  $5 + 5 - 1 = 9$
2.  $2 + 2 - 1 = 3$
3.  $1 + 1 - 1 = 1$
4.  $10 + 10 - 1 = 19$
5.  $4 + 4 - 1 = 7$
6.  $8 + 8 - 1 = 15$
7.  $6 + 6 - 1 = 11$
8.  $3 + 3 - 1 = 5$

## Module 11: Subtraction strategies

### Exercise 1 page 113

1. 5
2. 6
3. 2
4. 0
5. 5
6. 3
7. 12
8. 10
9. 11
10. 11
11. 13
12. 9

### Exercise 2 page 114

1. 3
2. 6
3. 4
4. 7
5. 7
6. 3
7. 5
8. 7
9.  $4 + 5 = 9$
10.  $7 + 5 = 12$
11.  $7 + 12 = 19$
12.  $11 + 7 = 18$

**Module 12:** Addition of whole numbers (sum up to 100)**Exercise 1** page 119

1. 69
2. 33
3. 43
4. 94
5.  $32 + 5 = 37$

**Exercise 2** page 119 and 120

1.  $43+6=49$
2.  $62+4=66$
3.  $8+35=43$
4.  $36+8=44$
5.  $46+5=51$
6.  $35+8=43$

**Module 13:** Subtraction of whole numbers (within 100)**Exercise 1** page 123

1. 42
2. 3
3. 14
4. 19
5. 35

**Exercise 2**

1.  $15 - 7 = 8$
2.  $37 - 7 = 30$
3.  $65 - 14 = 51$

**Module 14:** Personal strategies for addition (1)**Exercise 1** page 126

1.  $40+30+2+6 = 78$
2.  $60+20+5+4=89$
3.  $20+40+4+9=73$
4.  $60+20+4+6=90$
5.  $50+20+1+8=79$
6.  $60+30+5+1=96$

**Exercise 2** page 127

1. 52  
 $39+10+3=52$
2. 79  
 $48+30+1=79$
3. 82  
 $24+50+8=82$
4. 84

**Module 15:** Personal strategies for addition (2)**Exercise 1** page 129

1. 84
2. 41
3. 60
4. 32
5. 73

**Exercise 2** page 130

1. 41
2. 74
3. 91
4. 87
5. 61
6. 83
7. 81
8. 92

**Module 16:** Personal strategies for subtraction (1)**Exercise 1** page 133

1.  $39-13=26$
2.  $43-19=24$
3.  $54-26=28$
4.  $43-13=30$

**Exercise 2** page 133

1.  $45-15=30$
2.  $54-18=36$
3.  $94-76=18$
4.  $29-13=16$
5.  $34-12=22$

**Exercise 3** page 133

1.  $88-21=67$
2.  $48-17=31$
3.  $84-46=38$
4.  $97-35=62$

**Module 17:** Personal strategies for subtraction (2)**Exercise 1** page 137

1.  $49-27=22$
2.  $57-18=39$
3.  $84-39=45$
4.  $75-27=48$
5.  $72-55=17$

**Exercise 2** page 138

1.  $48-21=27$
2.  $82-43=39$
3.  $92-37=55$
4.  $73-55=18$
5.  $68-24=44$

**Exercise 3** page 138

1.  $42-26=16$
2.  $65-27=38$
3.  $96-74=22$
4.  $83-44=39$
5.  $58-23=35$

**Module 18:** Word problem involving addition (up to 100)**Exercise 1** page 142

1.  $48+51=99$
2.  $66+33=99$
3.  $32+57=89$
4.  $80+15=95$
5.  $62+8=70$
6.  $52+26=78$

**Exercise 2** page 142

1.  $42+19=61$  yams
2.  $47-38=9$  books
3.  $27+14=41$  oranges

**Module 19:** Word problems involving subtraction (within 100)**Exercise 1** page 146

1.  $51 - 13 = 38$  good snails
2.  $35 - 28 = 7$  pens
3.  $56 - 39 = 17$  toffees

## ANSWERS

### Exercise 2 page 147

1.  $84 - 65 =$   
 $84 - 70 = 14$   
 $14 + 5 = 19 \rightarrow 19$  bottle caps
2.  $73 - 58 =$   
 $73 - 60 = 13$   
 $13 + 2 = 15 \rightarrow 15$  mangoes
3.  $70 - 55 =$   
 $70 - 60 = 10$   
 $10 + 5 = 15 \rightarrow \text{¢}15$

### Reflection Exercise 3 page 148

1. 20
2. 55; 18
3.  $10 + 35 + 15 = 35 + 10 + 15$  in any order.
4.  $10 + 15 + 35 = 35 + 15 + 10$  in any order.
5. 40                      6. 61
7. 57                      8. 50
9. 30                      10. 47
11.  $98 - 15 = 83$
12. – 14. check on learners answers

### Reflection Exercise 4 page 149

1.  $\neq$                       2.  $=$
3.  $=$                       4.  $\neq$
5. 6                      6. 25
7. 19                      8. 55
9. 18                      10. 10
11. 27                      12. 27
13. 43                      14. 77
15. 75                      16. 37
17. 64                      18. 0

### Strand 1: Number

#### Sub Strand 3: Fractions

#### Module 1: Making halves

#### Exercise 1 page 152

1. a    2. b    3. b    4. a

#### Exercise 2 pages 153 and 154

1. 8                      2. 10                      3. 6
4. 4                      5. 12                      6. 22

### Module 2: Making quarters

#### Exercise 1 page 157

a, d, f, g,

#### Exercise 2 page 158

- 1.– 4. check on learners answers
5. 8 quarters
6. 16 quarters

7. 20 quarters

8. 12 quarters

### Module 3: Halves and quarters of an amount.

#### Exercise 1 page 160

1. One-half.
2. One-half
3. One-half

#### Exercise 2 page 161

1. One-quarter.
2. One-half.
3. One-quarter.
4. three-quarters.
5. One-half                      6. One-quarter
7. three-quarters                      8. One-half

#### Exercise 3 and 4 page 162

check on learners answers

#### Reflection exercise 5 page 163

1. ✓    2. X    3. ✓
- 4 - 6 Check on learners' answers.
7. one quarter                      8. one-half
9. three quarters                      10. one quarter
11. three quarters                      12. one half
13. one quarter

### Strand 1: Number

#### Sub Strand 4: Money

#### Module 1: Recognising Ghanaian coins and notes by name

#### Exercise 1 page 166

1. ¢2                      2. 50 pesewas
3. ¢1                      4. 20 pesewas
5. 60 pesewas                      6. 80 pesewas

#### Exercise 2 page 167

1. GH¢ 5                      2. GH¢ 16
3. GH¢ 8                      4. GH¢ 8

#### Exercise 3 page 166

- 1  $\rightarrow$  C    2  $\rightarrow$  A    3  $\rightarrow$  B    4  $\rightarrow$  A    5  $\rightarrow$  C

### Module 2: Relationship among the cedi notes

#### Exercise 1 page 171

1. 20
2. 4
3. 5
4. 5

5. 2

6. 2

**Exercise 2** page 172

1. ✓ 2. ✓ 3. X 4. X 5. ✓

**Reflection exercise 6** page 173

2. 5 cedis, 10 cedis, 20 cedis, 50 cedis.
3. 20 pesewas, 10 pesewas, 5 pesewas, 1 pesewa.
4. 5 cedis, 2 cedis, 1 cedi.
5. 5
6. Learners to do these.

**STRAND 2: Algebra**

**Sub-strand 1: Patterns and Relationship**

**Module 1: Increasing and decreasing number patterns**

**Exercise 1** pages 179 and 180

1. 37 39 41 43 (45) (47) (49)

The rule: Add 2

2. 52 57 62 67 (72) (77) (82)

The rule: Add 5

3. 49 54 59 64 (69) (74) (79)

The rule: Add 5

4. 33 43 53 63 (73) (83) (93)

The rule: Add 10

5. 27 32 37 42 47 (52) (57) (62)

The rule: Add 5

**Exercise 2** page 180

1. 84 79 74 69 (64) (59) (54)

The rule: Subtract 5.

2. 70 60 50 40 (30) (20) (10)

The rule: Subtract 10

3. 65 63 61 59 (57) (55) (53)

The rule: Subtract 2

4. 98 88 78 68 (58) (48) (38)

Rule: Subtract 10

5. 99 94 89 84 (79) (74) (69)

Rule: Subtract 5

6. 50 45 40 35 (30) (25) (20)

Rule: Subtract 5

**Module 2: Identifying errors/omissions in patterns**

**Exercise 1** page 183

1. Error 56
2. Error 64
3. Error 442
4. Error 45
5. Error 120

**Exercise 2** page 184

1. 355 , 350
2. 147 , 142
3. 769 , 764
4. 535 , 530

**Exercise 3** page 184

1. Error 15
2. Error 56
3. Error 442
4. Error 120

**Module 3: Finding missing terms in pattern**

**Exercise 1** page 186

1. 33, 43, (53), (63), (73), 83, 93
2. 15, (17), 19, (21), 23, (25), 27
3. 46, (51), 56, 61, (66), (71), 76
4. 54, 61, (68), 75, (82), (89), 96

**Exercise 2**

1. 98, 88, (78), (68), (58), 48, 38
2. 59, (56), 53, (50), 47, 44, (41)
3. 66, 60, (54), 48, 42, (36), (30)
4. 70, (65), 60, 55, (50), 45, (40)

**Module 4: Identifying and describing rules for patterns**

**Exercise 1** page 189

1. 36, 38, (40), (42), 44, (46), (48), 50 Add 2
2. 45, 50, (55), (60), 65, (70), (75), 80 Add 5
3. 83, (73), 63, (53), (43), 33, 23, (13) Subtract 10

**Exercise 2** page 189

1. Begin with 8. Make a pattern by adding 5.  
8 13 18 23 28 33
2. Begin with 17. Make a pattern by adding 2.  
17 19 21 23 25 27
3. Starting at 20, make a pattern by adding 10.  
20 30 40 50 60 70
4. Make a pattern by subtracting 10. Begin with 84.  
84 74 64 54 44 34

**Exercise 3** page 190

1. pen pencil book pencil.
2. girl girl boy girl.
3. spoon fork knife
4. ○ □ △
5. table, bottle, chair
6. check on learners' answers.
7. check on learners' answers.

## Reflection exercise 7

page 191

1. rule: Add 2
2. rule: Add 5
3. rule: Add 10
4. 3 8 13 18 23 28
5. 27 29 31 33 35 37
6. 30 40 50 60 70 80
7. Check on learners answers.

## Strand 3: Geometry and measurement

### Sub-strand 1: 2D and 3D Shapes

#### Module 1: Recognizing and naming 3D objects

##### Exercise 1

page 196

- |            |             |
|------------|-------------|
| 1. Cube    | 2. Sphere   |
| 3. Pyramid | 4. Cone     |
| 5. Cuboid  | 6. Cylinder |

##### Exercise 2

page 196

1. ✓    2. X    3. ✓    4. ✓    5. ✓

#### Exercises 3 and 4

page 197 & 198

Check on learners' answers

##### Exercise 5

page 199

1. cube
2. sphere
3. cuboid
4. pyramid
5. cylinder
6. cone

#### Module 2: Sorting 3D shapes

##### Exercise 1

page 201

Learners to do these.

##### Exercise 2

Learners to do these.

#### Module 3: Identifying 2D shapes

##### Exercise 1

page 205

1. 4
2. 0
3. 4
4. 3
5. equal.
6. equal.
7. no.

##### Exercise 2

page 206

Learners to do these.

#### Module 4: Sorting 2D shapes

##### Exercise 1

page 208

Red -- 2, 8

Green -- 4,7,10

##### Exercise 2

page 209

Learners to do these.

#### Module 5: Identifying 2D shapes in everyday objects

##### Exercise 1

page 211

Check on learners' answers

##### Exercise 2

Learners to do these.

#### Reflection exercise 8

page 212

1. Pyramid    2. Cuboid    3. Cube
4. Check on learners' answers.
5. 8
6. 6
7. 1
8. Check on learners' answers.

#### Strand 3: Geometry

##### Sub Strand 2: Position/transformation

#### Module 1: Different orientations of shapes

##### Exercise 1

page 215

Check on learners' answers

##### Exercise 2

page 216

1. → d;    2. → c;    3. → a;    4. → e;    5. → b;

#### Reflection exercise 9

page 217

Check on learners' answers.

#### Strand 3: Geometry and Measurement

##### Sub Strand 3: Measurement – Length, Mass, Capacity and Time

#### Module 1: Measuring lengths

##### Exercise 1

page 219

Check on learners' answers.

##### Exercise 2

page 220

Check on learners' answers.

#### Module 2: Measuring mass

##### Exercise 1

page 223

- 1) a book    2) b table    3) a cow

**Exercise 2** page 224

1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>, and 5<sup>th</sup>  
 ↑ ↓   ↑ ↓   ↑ ↓   ↑ ↓   ↑ ↓  
 3   1   5   4   2

**Module 3: Measuring capacity.**

**Exercise 1** page 226

1. less than
2. less than
3. more than

**Exercise 2** page 227

1 → 4<sup>th</sup>   2 → 3<sup>rd</sup>   3 → 5<sup>th</sup>   4 → 2<sup>nd</sup>   5 → 1<sup>st</sup>

**Module 4: Comparing 3 or more objects**

**Exercise 1** page 230

1. a   2. b   3. a

**Exercise 2** page 231

Tick (✓)

1. a   2. b   3. a

**Module 5: Standard unit for measuring length**

**Exercise 1 and 2** page 233 & 234

Check on learners answers

**Module 6: Reading the calendar**

**Exercise 1** page 237

1. 5<sup>th</sup> March 2019   2. 10<sup>th</sup> May 2019
3. 15<sup>th</sup> July 2019   4. 20<sup>th</sup> December 2019

**Exercise 2** page 238

1. March and May
2. April, June, November, September. (any three)
3. 2<sup>nd</sup> and 30<sup>th</sup>.

**Module 7: Measuring time using arbitrary units**

**Exercise 1** page 240

Check on learners' answers.

**Exercise 2** page 241

Check on learners' answers.

**Module 8: Relationship between units of time**

**Exercise 1** page 245

1. 5 o'clock   2. 3 o'clock   3. 1 o'clock
4. 6 o'clock   5. 8 o'clock   6. 11 o'clock

**Exercise 2** page 245

Check on learners' answers.

**Exercise 3** page 246

1. seconds: 40   2. seconds: 55  
minutes: 30   minutes: 15  
hours: 1   hours: 6
3. seconds: 15  
minutes: 5  
hours: 2

**Exercise 4** page 247

1. 60
2. 24
3. 7
4. 12

**Exercise 5** page 247

1. 480
2. 180
3. 48
4. 1440
5. 24

**Reflection exercise 10** page 248 & 249

1. 7 units   3. a
2. 5   4. b
5. Heavy - c heavier - a   heaviest - b
6. heavier
7. lighter
8. Colour 1<sup>st</sup> October red.
9. Colour the last Saturday in October yellow.
10. Which Saturday comes after 21 October? Color it blue. ( 24th October)
11. 5 Thursdays
12. Half past one
13. Half past ten
14. Half past nine
15. Half past 2 o'clock
16. 10 to 6 o'clock
17. Quarter past 5 o'clock





## ANSWERS

### Strand 4: Data

Sub-strand 1: Data Collection, Organisation, Interpretation, Presentation and Analysis

#### Module 1: Collecting and organizing data

##### Exercise 1 page 255

1. Count and record the number of each fruit in the table using tally.

Fruits	Tally	Number
(apple)	### //	7
orange	###	5
(banana)	### ###	10
(pear)	### ### //	12

2. Pear  
3. Orange  
4. 34

##### Exercise 2 page 256

1. 13  
2. 19  
3. Fatau  
4. 15  
5. 1  
6. 4

#### Module 2: Collecting and organising data

##### Exercise 1 page 260

1. Cloudy  
2. Stormy  
3. 12 days  
4. 2 days  
5. 31 days

##### Exercise 2 page 261

Graph showing 12 circles 12 rectangles 8 squares

1. 4  
2. 20  
3. 12

##### Reflection exercise 11 page 263

1.

Ages (in years)	Talley	Number of learners
6	### ### ### /	15
7	### ### ### ### /	21
8	### ### ////	14

2. 14   3. 7   4. 6   5. 50

# STRAND 1 Number

**Sub Strand 1:** Number: Counting, Representation, cardinality and ordinality

## Module 1: Number names

### Trial 1 page 2

- 1 12 → Twelve
- 2 18 → Eighteen
- 3 17 → Seventeen
- 4 15 → Fifteen

### Trial 2 page 3

1. 38
2. 57
3. 90
4. 29
5. 99

### Trial 3 page 4

1. Seven hundred and eighty
2. Four hundred and ninety nine
3. Nine hundred and seventy five
4. One hundred and fifty six
5. One thousand
6. 676
7. 485
8. 227

## Module 2 Counting sequence

### Trial 1 page 5

22	26	28	32	34	38	40
42	44	48	50	54	56	58
60	64	66	70	72	76	78
82	86	92	94	98	100	

### Trial 2

1. 48 46 40 38
2. 74 70 68 66
3. 14 12 10 8 6 4
4. 12 10 6 4 2
5. 13 11 9 7 5

### Trial 3 page 6

1. 505 510 515 520 525
2. 595 600 610 620
3. 675 685 690 695
4. 975 980 990 995

### Trial 4 page 7

1. 200 195 185 180
2. 325 315 310 305
3. 495 490 485 480
4. 395 390 385 375

### Trial 5 page 7

1. a. 660 670 680 690 700 710  
720 730 740
- b. 920 930 940 950 960 970  
980 990
2. a. 990 980 970 960 950 940  
930 920
- b. 900 880 870 860 850 830  
820 810

## Module 3: Counting to find “how many”

### Trial 1 page 8

Count by 2s.

2	4	6	8	10
12	14	16	18	20
22	24	26	28	30
32	34	36	38	40
42	44	46	48	50

### Trial 2 page 9

1. Count the eggs by 5s.  
How many eggs are there? 60
2. Count the bananas by 5s.  
How many bananas are there? 60

### Trial 3 page 10

1. 60
2. 50
3. 50
4. 30
5. 120

## Module 4: Representing quantities with numerals.

### Trial 1 page 11

1. 122
2. 321
3. 500
4. 304
5. 281

### Trial 2 page 12

1. 113
2. 745
3. 805
4. 920

## Module 5: Estimating quantities.

### Trial 1 page 13

1. Estimate number - Check on learners answer.  
Actual number – 75
2. Estimate number - Check on learners answer  
Actual number – 58
3. Estimate number – Check on learners answer.  
Actual number – 63

## ANSWERS

### Trial 2 page 14

1. Estimate number - Check on learners answer.  
Actual number - 83
2. Estimate number - Check on learners answer  
Actual number - 40

### Trial 3

Learners to do these.

### Module 6: Describing position of numbers

#### Trial 1 page 15

1. 67
2. 34, 29 and 88
3. 88
4. 26
5. 19

#### Trial 2 page 16

1. 877
2. 698 and 708
3. 475
4. 999
5. 887

#### Trial 3 page 17

1. 900
2. 21
3. 159 and 6
4. 30 and 54
5. 234

### Module 7: Counting to find "how long" using non - standard unit.

#### Trial 1 page 18

Learners to do these.

#### Trial 2 page 19

Learners to do these.

#### Trial 3 page 20

Learners to do these.

### Module 8: Counting to find "how much" or "how many"

#### Trial 1 page 21

1. Learners to do these.
2. 5

#### Trial 2

1. Eight
2. One
3. True

### Module 9: Place value

#### Trial 1 page 22

1. a. 

4
---

 tens      

6
---

 ones      b. 

6
---

 tens      

2
---

 ones

2. a. 67      b. 25      c. 66  
tens ones      tens ones      tens ones  

6
---

7
---

2
---

5
---

6
---

6
---

- d. 95      e. 44      f. 28  
tens ones      tens ones      tens ones  

9
---

5
---

4
---

4
---

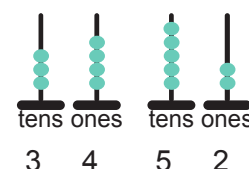
2
---

8
---

3. Learners to do these.

#### Trial 2 page 23

1. 3 tens and 4 ones = 34
2. 5 tens and 2 ones = 52



3. 73 = 7 tens and 3 ones
4. 28 = 2 tens 8 ones
5. 65 = 6 tens and 5 ones
6. 91 = 9 tens 1 one

#### Trial 3 page 24

- 1.

4 5 8 T	6 3 7 O	7 1 6 H
5 3 3 H	1 5 9 O	3 2 1 T
2 0 6 T	9 7 2 H	8 6 4 O
4 1 5 H	9 6 0 T	4 0 0 O

2. a. 262  
b. 538

### Module 10: Partitioning whole numbers.

#### Trial 1 page 25

1. 6 ; 70
2. 65
3. 50
4. 49
5. 80 ; 3

#### Trial 2

1. 50 + 0
2. 80 + 2
3. 20 + 8
4. 70 + 3
5. 30 + 0

**Trial 3** page 26

- |    |     |     |   |    |   |   |
|----|-----|-----|---|----|---|---|
| 1. | 562 | 500 | + | 60 | + | 2 |
| 2. | 134 | 100 | + | 30 | + | 4 |
| 3. | 850 | 800 | + | 50 | + | 0 |
| 4. | 428 | 400 | + | 20 | + | 8 |
| 5. | 705 | 700 | + | 0  | + | 5 |

**Trial 4**

Learners to do these.

**Module 11: Describing numbers in equivalent ways.**
**Trial 1** page 27

1. 54 is more than 39
2. 14 is smaller than 15
3. 92 is more than 82
4. 68 is more than 65

**Trial 2**

1. smaller than
2. more than
3. more than
4. more than
5. smaller than

**Trial 3** page 28

1. bigger
2. 2 more than and 2 less than
3. a little bit
4. after
5. a lot bigger
6. almost half
7. before

**Module 12: Arranging objects in different ways.**
**Trial 1** page 29

Learners to do these.

**Trial 2** page 30

Learners to do these

**Trial 3** page 31

1. Fill in the spaces.
 

a.	8	5	4
b.	44		
2.
 

a.	9	7	3
b.	66		

**Module 13: Comparing whole numbers**

using >, < or =

**Trial 1** page 32

- |    |      |   |          |        |
|----|------|---|----------|--------|
| 1. | 50   | < | $80 + 5$ | 54     |
| 2. | 40+0 | > | $20 + 8$ | 20+20  |
| 3. | 71   | < | $70 + 7$ | 10+7   |
| 4. | 60+6 | < | 1 + 60   | $90+1$ |

**Trial 2**

1. true
2. false
3. true
4. false
5. true

**Trial 3** page 33

- |    |    |    |
|----|----|----|
| 1. | 89 | 78 |
| 2. | 29 | 50 |
| 3. | 57 | 75 |
| 4. | 37 | 94 |
| 5. | 89 | 62 |

**Module 14: Ordering whole numbers.**
**Trial 1** page 34

- |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|
| 1. | 22 | 30 | 48 | 63 | 72 | 75 |
| 2. | 75 | 72 | 63 | 48 | 30 | 22 |
| 3. | 97 | 90 | 83 | 65 | 28 | 25 |
| 4. | 25 | 30 | 70 | 87 | 92 | 98 |

**Trial 2** page 35

1. a. 35, 83, 53, 85, 58, 38 in any order  
b. 35, 38, 53, 58, 83, 85 from smallest
2. a. 47, 42, 74, 72, 24, 27 in any order  
b. 74, 72, 47, 42, 27, 24 in decreasing order

**Trial 3**

- |           |           |           |
|-----------|-----------|-----------|
| a. 23, 18 | b. 32, 16 | c. 75, 14 |
|-----------|-----------|-----------|

**Module 15: Finding missing numbers**
**Trial 1** page 36

- |    |    |    |    |    |
|----|----|----|----|----|
| 1. | 36 | 40 | 42 | 44 |
| 2. | 50 | 65 | 70 | 75 |
| 3. | 55 | 65 | 75 | 95 |
| 4. | 48 | 58 | 78 | 88 |
| 5. | 65 | 75 | 85 | 95 |

## ANSWERS

### Trial 2 pages 36 and 37

1.

	56	57	58	59
65		67		69
75				
95				

2.

	24	25		27	28
33					38
43					
					58
63					68

3.

57			
67			
77			
	88	89	90
97	98	99	100

4.

35		37	38	39
45				
	56	57	58	59
65				
75				

5.

		24		26	27
		34			37
		44			47
		54			
	62	63			

6.

9		11	12
	20		22
	30		
	40		42
49	50	51	52

### Trial 3 page 37

1.

	65	66
74	75	76
84		86

2.

16		18
26	27	
	37	38

3.

	79	80
88		90
98	99	

4.

72	73	
82		84
	93	94

5.

33	34	35
43		45
53	54	55

6.

26	27	28
	37	
46	47	

### Module 16: Word problems involving comparison.

#### Trial 1 page 38

- Fatima has a lot less cola nuts than Amina or Amina has a lot more cola nuts than Fatima
- Opoku has a lot less tennis balls than Asare, or Asare has a lot more tennis balls than Opoku
- a, 40      b, Dzifa
- Twenty-five (25)

#### Trial 2 page 39

- Five (5) toffees
- Twenty (20) oranges
- Seventy-eight (78)

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

#### Module 1: Addition of whole numbers.

##### Trial 1 page 40

Match the addition sentence on the left to that on the right.

- |            |   |       |
|------------|---|-------|
| 1. $19+10$ | → | 30+15 |
| 2. $10+4$  | → | 5+31  |
| 3. $15+30$ | → | 10+19 |
| 4. $31+5$  | → | 4+10  |

##### Trial 2 pages 40 and 41

- $15 + 5 + 8 = 8 + 5 + 15$
  - $12 + 2 + 31 = 31 + 2 + 12$
  - $26 + 4 + 53 = 53 + 4 + 26$
  - $62 + 17 + 20 = 20 + 17 + 62$
- Check on other different orders from learners.

**Trial 3** page 41

1. 7 +10 +3, 10 +3 +7
2. 8 +5 +5 5 +8 +5
3. 9 +3 +1 1 +3 +9

Check on other different ways from learner answers.

**Module 2: Adding or subtracting zero**

**Trial 1** page 42

1.  $17 + 0 = 17$
2.  $28 + 0 = 28$
3. Learners to do these.

**Trial 2** page 43

1. 39
2. 82
3. 75
4. 67
5. 96
6. 100
7. 57
8. 56

**Trial 3**

1. 0
2. 0
3. 56
4. 82
5. 32
6. 100
7. 13
8. 52

**Module 3: Finding missing numbers**

**Trial 1** page 44

1. 38
2. 36
3. 44
4. 28
5. 36
6. 19
7. 44
8. 53
9. 46
10.  $36 + \square = 75$  ; 39 English books

**Trial 2** page 45

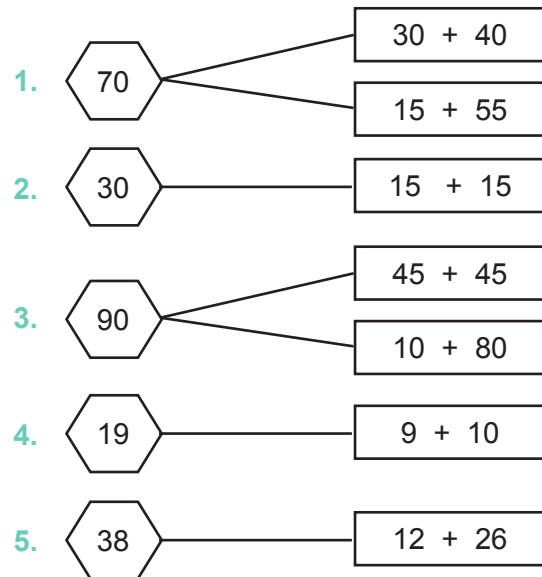
1. 36
2. 14
3. 35
4. 29
5. 52

**Trial 3** pages 45 and 46

Check on learners' answers

**Module 4: Word problems addition and subtraction.**

**Trial 1** page 47



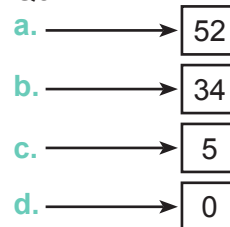
**Trial 2** page 48

Learners to do these.

**Trial 3** page 49

Q1 and 2 check on learners answers.

**Q3**



**Module 5: Addition and subtraction of whole numbers using = and  $\neq$  signs**

**Trial 1** page 50

1. true
2. true
3. true
4. true
5. false
6. true
7. false

**Trial 2** page 51

1. 3
2. 6
3. any number except 80
4. 45
5. 13
6. any number except 2

## ANSWERS

7. any number except 39
8. 88      9. 2
10. any number except 0
11. any number except 15
12. 21      13. 0
14. any number except 26
15. any number except 5
16. 37

### Trial 3 page 52

Eg.  $\neq$

1.  $=$
2.  $=$
3.  $\neq$
4.  $\neq$
5.  $=$

### Trial 4

1. 14      2. 25
3. 72      4.  $\neq$
5.  $\neq$

### Module 6: Relationship between addition and subtraction.

#### Trial 1 page 53

1.  $48 + 6 = 54$       2.  $63 + 9 = 72$   
 $54 - 6 = 48$        $72 - 9 = 63$   
 $54 - 48 = 6$        $72 - 63 = 9$
3.  $85 + 4 = 89$       4.  $37 + 12 = 49$   
 $89 - 4 = 85$        $49 - 37 = 12$   
 $89 - 85 = 4$        $49 - 12 = 37$
5.  $51 + 8 = 59$       6.  $70 + 10 = 80$   
 $59 - 8 = 51$        $80 - 10 = 70$   
 $59 - 51 = 8$        $80 - 70 = 10$

#### Trial 2 page 54

1. 52 23 75  
 $52 + 23 = 75$   
 $75 - 52 = 23$
2. 27 41 14      3. 55 47 8  
 $27 + 14 = 41$        $47 + 8 = 55$   
 $41 - 27 = 14$        $55 - 47 = 8$
4. 63 25 38      5. 79 7 72  
 $25 + 38 = 63$        $72 + 7 = 79$   
 $63 - 25 = 38$        $79 - 72 = 7$

Accept other arrangements from learners. E.g.

1.  $23 + 52 = 75$   
 $75 - 23 = 52$

### Trial 3 page 55

Learners to do these.

### Module 7: Addition and subtraction facts

#### Trial 1 page 56

- 44  $\rightarrow$  34;      73  $\rightarrow$  63;      99  $\rightarrow$  89;
- 26  $\rightarrow$  16;      38  $\rightarrow$  28;      57  $\rightarrow$  47;
- 81  $\rightarrow$  71;      27  $\rightarrow$  17      100  $\rightarrow$  90

#### Trial 2

1. 47 49      2. 21 23
3. 89 91      4. 88 90
5. 36 38      6. 63 65

#### Trial 3 page 57

1. One more than  
 $13 \rightarrow 14$        $16 \rightarrow 17$        $19 \rightarrow 20$
2. Two more than  
 $10 \rightarrow 12$        $17 \rightarrow 19$        $14 \rightarrow 16$
3. One less than  
 $14 \rightarrow 13$        $11 \rightarrow 10$        $19 \rightarrow 18$
4. Two less than  
 $17 \rightarrow 15$        $11 \rightarrow 9$        $20 \rightarrow 18$

#### Trial 4

1. 80  
89 90 91      2. 12 13 14  
100      23

### Module 8: Double of numbers (1 – 12)

#### Trial 1 page 58

1.  $4 + 4 = 8$       2.  $6 + 6 = 12$
3.  $5 + 5 = 10$       4.  $8 + 8 = 16$
5.  $7 + 7 = 14$

#### Trial 2

1. 4      2. 10
3. 12      4. 20
5. 16      6. 6

#### Trial 3 page 59

1. 4: 8
2. 6: 12
3. 8: 16
4. 5: 10
5. 12: 24

#### Trial 4

1. 8
2. 12
3. 22
4. 20
5. 16



**Module 9: Addition and subtraction facts**  
(fluency 2)

**Trial 1** page 60

1. 6                      2. 1  
3. 0                      4. 8  
5. 3

**Trial 2** page 61

1. 15                      2. 11  
5 + 10 = 15                      4 + 11 = 15  
3. 15                      4. Learners to do these.  
15 + 4 = 19

**Trial 3**

1. 2                      2. 6                      3. 8  
2 + 18 = 20                      14 + 6 = 20                      12 + 8 = 20  
Accept 18+2=20 accept 6+14=20 accept 8+12=20

**Module 10: Addition and subtraction facts 2**  
(fluency 3)

**Trial 1** page 62

1. 7 + 5 = 12                      2. 9 + 6 = 15  
7 + 3 + 2 = 12                      9 + 1 + 5 = 15  
3. 8 + 8 = 16                      4. 9 + 9 = 18  
6 + 2 + 8 = 16                      9 + 1 + 8 = 18  
5. 3 + 7 = 10                      6. 4 + 9 = 13  
0 + 3 + 7 = 10                      4 + 6 + 3 = 13

**Trial 2** page 63

1. 2 + 3  
2 + 2 + 1 = 5  
2. 8 + 9  
8 + 8 + 1 = 17  
3. 3 + 4  
3 + 3 + 1 = 8  
4. 7 + 8  
7 + 7 + 1 = 15  
5. 5 + 6  
5 + 5 + 1 = 11  
6. 1 + 2  
1 + 1 + 1 = 3  
7. 4 + 5  
4 + 4 + 1 = 9

**Trial 3** page 64

1. 8 + 7  
8 + 8 - 1 = 15  
2. 6 + 5  
6 + 6 - 1 = 11  
3. 2 + 1  
2 + 2 - 1 = 3  
4. 10 + 9  
10 + 10 - 1 = 19  
5. 9 + 8  
9 + 9 - 1 = 17  
6. 5 + 4  
5 + 5 - 1 = 9  
7. 4 + 3  
4 + 4 - 1 = 7  
8. 8 + 7  
8 + 8 - 1 = 15

**Module 11: Subtraction strategies**
**Trial 1** page 65

1. 3                      2. 11                      3. 6  
4. 19                      5. 13                      6. 15  
7. 1                      8. 1                      9. 18

**Trial 2**

1. 5                      2. 5                      3. 6  
4. 11                      5. 11

**Trial 3** page 66

1. 3                      2. 4                      3. 4                      4. 7                      5. 5

**Trial 4**

1. 9                      2. 4                      3. 4                      4. 8

**Module 12: Addition of whole numbers**  
(sum up to 100)

**Trial 1** page 67

1. 60 + 20 = 80                      2. 56 + 33 = 89  
3. 43 + 33 = 76

**Trial 2** page 68

1. 80 + 19 = 99  
2. 35 + 22 = 57  
3. 47 + 24 = 71

**Trial 3** page 69

1. 38 + 50 = 88                      2. 72 + 25 = 97  
3. 64 + 22 = 86                      4. 18 + 80 = 98  
5. 13 + 52 = 65

**Module 13: Subtraction of whole numbers**  
(within 100)

**Trial 1** page 70

1. 44  
2. 53  
3. 62  
4. 20

**Trial 2** page 71

1. 38                      2. 8                      3. 17  
4. 46                      5. 47  
6. 32                      7. 51  
8. 65                      9. 13  
10. 33

**Trial 3** page 72

1. 23                      2. 6  
3. 26                      4. 17

## ANSWERS

### Module 14: Personal strategies for addition (1)

#### Trial 1 page 73

1. 69  
2. 35  
3. 66

#### Trial 2 page 74

1. 83  
3. 81  
5. 81  
2. 83  
4. 64  
6. 67

#### Trial 3 page 75

1. 78  
3. 72  
5. 99  
2. 89  
4. 78

### Module 15: Personal strategies for addition (2)

#### Trial 1 page 76

1. 85 2. 65 3. 83 4. 82 5. 82 6. 46

#### Trial 2 page 77

1. 75  
3. 91  
5. 94  
2. 81  
4. 92

#### Trial 3 page 78

Add: use the compensation strategy.

1. 85  
3. 85  
5. 82  
2. 62  
4. 80  
6. 63

### Module 16: Personal strategies for subtraction (1)

#### Trial 1 page 79

1. 17  
3. 21  
5. 7  
7. 19  
2. 23  
4. 15  
6. 27  
8. 29

#### Trial 2 page 80

1. 23  
3. 18  
2. 18  
4. 23

#### Trial 3 page 81

1. 18  
3. 17  
2. 17  
4. 17

### Module 17: Personal strategies for subtraction (2)

#### Trial 1. page 82

1. 13  
2. 19  
3. 28  
4. 36

#### Trial 2 pages 83 and 84

1. 11 2. 28 3. 23 4. 19

#### Trial 3 page 85

1. 24  
2. 24  
3. 36  
4. 9  
5. 36

### Module 18: Word problems involving addition (up to 100)

#### Trial 1 page 86

1.  $63 + 24 = 87$   
2.  $48 + 50 = 98$   
3.  $85 + 12 = 97$   
4.  $56 + 44 = 100$

#### Trial 2 page 87

1.  $18 + 25 = 43$   
2.  $18 + 12 = 30$   
3.  $\square + 13 = 57$   $\square = 44$   
4.  $26 + 52 = 78$   
5.  $37 + 25 = 62$

### Module 19: Word problems involving subtraction (within 100)

#### Trial 1 page 90

1.  $98 - 35 = 63$   
2.  $59 - 32 = 27$   
3.  $85 - 73 = 12$   
4.  $48 - 25 = 23$

#### Trial 2 page 91

1.  $69 - 42 = 27$   
2.  $18 + 12 - 13 = 17$   
3.  $14 + 34 - 16 = 32$   
4. 25

#### Trial 3 page 93

1.  $27 + 14 - 15 = 26$   
2.  $67 - 28 + 15 = 54$   
3.  $86 - 37 = 49$   
4.  $81 - 29 = 52$

### Sub Strand 3 FRACTION

#### Module 1: Making halves

**Trial 1** page 95

Learners to do these.

**Trial 2** page 96

1. 8
2. 10
3. 6
4. 4

#### Module 2: Making quarters

**Trial 1** page 97

1. 1, 3, 4, 6 and 8 → quarters.
2. 2, 5, 7, 9 and 10 → not quarters

**Trial 2** page 98

Learners to do these.

**Trial 3**

Learners to do these.

**Trial 4** page 99

1. 16
2. 20
3. 12
4. 8

#### Module 3: Halves and quarters of an amount.

**Trial 1** page 100

1. Shade 5 squares
2. 6 squares
2. 7 squares
4. 4 squares

**Trial 2**

Learners to do these.

**Trial 3** page 101

- 1 - 8 Learners to do these
9. 40
10. 12
11. 4

### Strand 1: Number

#### Sub-strand 4: Money

**Module 1: Recognize Ghanaian coins and notes by name**

**Trial 1** page 102

1. GH¢ 10
2. GH¢ 2
3. GH¢ 1
4. GH¢ 2
5. GH¢ 50
6. 5 p

7. GH¢ 5

9. 10 p

8. GH¢ 1

10. 1 p

**Trial 2** page 103

Learners to do these.

**Trial 3**

1. Ten Ghana cedis and fifty pesewas.
2. One Ghana cedi and Two Ghana cedis.
3. Check on learners' answers.

#### Module 2: Relationship among the Ghana cedi notes.

**Trial 1** page 104

1. ✓
4. ✓
6. ✓

**Trial 2** page 105

Learners to do these

**Trial 3** page 106

1. ✓
3. ✓
4. ✓

### Strand 2: Algebra

#### Sub strand 1: Patterns and relationships

**Module 1: Increasing and decreasing number patterns**

**Trial 1** page 108

Adding 2 – 2,5

Adding 5 – 3,6

Adding 10 – 1,4

**Trial 2** page 109

Increasing – 1,3,6,7,8,

Decreasing –2, 4, 5, 8

**Trial 3** page 110

Learners to do these.

#### Module 2: Identifying errors / omissions in patterns

**Trial 1** page 111

1. 45
2. 20
3. 55
4. 100
5. 60

## ANSWERS

### Trial 2 page 112

- 70 Increased by 1 instead of by 2
- 91 Increased by 1 instead of by 2
- 48 Increased by 1 instead of by 2
- 120 Increased by 1 instead of by 2

### Module 3: Finding missing terms in patterns

#### Trial 1 page 113

- 18 20 22 24 26 28 30
- 37 42 47 52 57 62 67
- 59 61 63 65 67 69 71
- 44 54 64 74 84 94 104
- 9 13 17 21 25 29 33
- 21 25 29 33 37 41 45
- 4 13 22 31 40 49 58
- 45 48 51 54 57 60 63

#### Trial 2 page 114

- 53 51 49 47 45 43 41
- 85 80 75 70 65 60 55
- 96 86 76 66 56 46 36
- 61 59 57 55 53 51 49
- 42 37 32 27 22 17 12

#### Trial 3

- 37 35 33
- 37 32 27
- 45 35 25

### Module 4: Identifying and describing rules for patterns

#### Trial 1 page 115

- 18; Add 2
- 45; Add 2
- 78; Add 5
- 88; Add 10

#### Trial 2 page 116

- 20; Subtract 5.
- 22; Subtract 10
- 56; Subtract 2
- 75; Subtract 5

#### Trial 3 page 117

Learners to do these.

### Trial 4 page 118

- 65 67 69 71 73 75
- 42 52 62 72 82 92
- 83 73 63 53 43 33
- 35 33 31 29 27 25
- 99 94 89 84 79 74

## STRAND 3 Geometry and measurement

### Sub Strand 1: Shapes and objects

#### Module 1: Recognizing and naming 3D objects.

##### Trial 1 page 120

- |             |              |
|-------------|--------------|
| 1 → cube    | 2 → cylinder |
| 3 → sphere  | 4 → pyramid  |
| 5 → pyramid | 6 → cylinder |
| 7 → cuboid  | 8 → cone     |

##### Trial 2 page 121

- |                                |   |   |    |
|--------------------------------|---|---|----|
| <b>A</b> Cube                  | 6 | 8 | 12 |
| <b>B</b> Cone                  | 2 | 1 | 1  |
| <b>C</b> Pyramid (rectangular) | 5 | 5 | 8  |
| <b>D</b> Cuboid                | 6 | 8 | 12 |
- Sphere and cube ; Pyramid and cuboid

#### Module 2: Sorting 3D objects

##### Trial 1 page 122

Learners to do these.

##### Trial 2 page 123

Learners to do these

##### Trial 3

Learners to do these.

#### Module 3: Identifying 2D shapes

##### Trial 1 page 124

- |                         |                            |
|-------------------------|----------------------------|
| 1. triangles → f, j, l, | 2. squares → a, c, g       |
| 3. circles → b, k, m    | 4. e, h, o, n (rectangles) |
| 5. pentagon → i, q      | 6. hexagons → d, p         |

##### Trial 2 page 125

- Circle
- Rectangle
- Hexagon
- Triangle
- 4
- 4
- 1
- 5

**Trial 3** page 126

	Number of straight sides	Number of curved sides	Number of corners
1	0	1	0
2	4	0	4
3	3	0	3
4	5	0	5
5	6	0	6

Learners to do the colouring.

**Module 4: Sorting 2 D shapes**
**Trial 1** page 127

1. → e      2. → b      3. → f  
4. → a      5. → d      6. → c

**Trial 2** page 128

Hexagon - F,  
Not a hexagon - A, B, C, D, E, G

**Trial 3**

Learners to do these.

**Module 5: Identifying 2 D shapes in everyday objects.**
**Trial 1** page 129

1. → no matching  
2. → d      3. → c  
4. → a, e      5. → no matching  
6. → no matching

**Trial 2** page 130

Learners to do these.

**Sub strand 2 Position/transformation**
**Module 1: Different orientations of shapes**
**Trial 1** page 131

Learners to do these.

**Trial 2** page 132

Learners to do these.

**Trial 3**

Learners to do these.

**Sub Strand 3: Measurement – Length, Mass and Capacity**
**Module 1: Measuring lengths**
**Trial 1** page 133

1. 10      2. 4      3. 7  
4. 7      5. 8

**Trial 2** page 134

Learners to do these.

**Trial 3**

Learners to do these.

**Module 2: Measuring mass**
**Trial 1** page 135

1. b banana      2. a tennis ball  
3. a 1 apple      4. a 1 tomato

**Trial 2**

Learners to do these.

**Trial 3** page 136

1. 6 units      2. apple      3. 4 units  
4. banana      5. 13 units      6. banana  
7. apple

**Module 3: Measuring capacity**
**Trial 1** page 137

1. b      2. a      3. a      4. b      5. b

**Trial 2** page 138

- a → 3<sup>rd</sup>      b → 5<sup>th</sup>      c → 4<sup>th</sup>  
d → 1<sup>st</sup>      e → 2<sup>nd</sup>

**Trial 3**

Learners to do these

**Module 4: Comparing 3 or more objects**
**Trial 1** page 139

1. Adwoa      2. c      3.  
a  
4. a      5. c      6.  
a

**Trial 2** page 140

1. a. long      b. longest      c. longer  
2. learners to do these.

**Trial 3** page 141

1. b      2. c      3. b      4. a

## ANSWERS

### Module 5: Standard unit for measuring length

#### Trial 1 page 142

- 4 pencils 10 paper clips
  - Paper clips. They are shorter.
- 16 blocks 22 beads
  - Blocks. They are longer.

#### Trial 2 page 143

Learners to do these.

#### Trial 3

- Stick A = 9cm
- Stick B = 5cm
- Stick C = 7cm
- longer
- shorter
- longer

### Module 6: Reading the calendar

#### Trial 1 page 144

- Learners to do these.
- 10<sup>th</sup> July 2019 to 16<sup>th</sup> July 2019;  
7 days or 1 week
- 18<sup>th</sup> July 2019 to 31<sup>st</sup> July 2019,  
14 days or 2 weeks.

#### Trial 2 page 145

- The 3<sup>rd</sup> month of the year → March  
The month after September → October  
The month before December → November  
The last month of the year → December
- 12
- 1
- April August  
March May

### Module 7: Measuring time using arbitrary units

#### Trial 1 page 146

- b
- a
- a

#### Trial 2 page 147

Learners to do these.

#### Trial 3

- Check on learners' answers.
- minutes
- hours

### Module 8: Relationship between units of time.

#### Trial 1 pages 148 and 149

- 30 minutes → half an hour;
- quarter of an hour → 15 minutes;
- 60 seconds → 1 minute;
- 180 seconds → 3 minutes.
- 60 seconds
- 120 seconds
- 24 hours
- 720 minutes
- 36 months
- 4 weeks
- 8 weeks

#### Trial 2 page 149

- 300 seconds
- 30 minutes
- 240 hours
- 15 minutes
- 2880 minutes
- 48 hours
- 30 seconds
- 360 minutes
- 108 hours
- 120 hours

#### Trial 3 pages 150 and 151

- 1: 30 1
  - 7: 45 8
  - 9 o'clock or 9:00
  - 4:15, a quarter past 4
- check on learners answers
  - 15 minutes
- check on learners answers
  - 30 minutes

#### Trial 4 page 151

- 9:00
  - 9:15 or a quarter past 9 o'clock
  - 15 minutes
- 1:30 (half past one)
- 10:30 (half past ten)
- 9:30 (half past nine)
- 6:30 (half past six)
- 5:30 (half past five)
- 8:30 (half past eight)
- 8 – 13. Check learners diagrams.

**Strand 4: Data**

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

**Module 1:** Collecting and organising data

**Trial 1** page 154

1	Flower	Number
	red flower	15
	yeloow flower	38
	White flower	26

2. 79                      3. 12  
4. red flower

**Trial 2** page 155

1. 24                      2. 24  
37  
18  
3. 55                      4. 13  
5. 79

**Trial 3** page 156

1. 11                      2. 8  
3. 13                      4. 12  
5. 7                      6. 9  
7. 11                      8. 13  
9. 15                      10. 6  
11. 5                      12. 10  
13. 16                      14. 4

**Module 2:** Interpretation of graphs

**Trial 1** page 157

1. Crickets                      2. 4  
3. 2                      4. 9  
5. 14

**Trial 2** page 158

1. Tetteh                      2. Serwaa  
3. 3                      4. 5  
5. 18

**Trial 3** pages 159 and 160

1. Sheep                      2. 6  
3. 25                      4. 4  
5. Goats and Cows

**Trial 4** pages 160 and 161

1. 15  
2. Triangular  
3. 34



# ESSENTIAL Mathematics Primary 2

Teacher's Guide

**ESSENTIAL Mathematics Primary Book 2** 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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