

ESSENTIAL



Mathematics

Primary 2

Teacher's Guide



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ESSENTIAL Mathematics Primary 2

Teacher's Guide

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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
Module 1: Number names	Lesson 1: Number names one - twenty Lesson 2: Number Name (Twenty – One Hundred) Lesson 3: Number Name (100 – 1000)	10 - 15	2 - 4	2 2 - 3 3
Module 2: Counting sequence	Lesson 1: Skip count forward by 2s (1– 60). Lesson 2: Skip count backwards by 2s (60 - 1). Lesson 3: Skip count forwards by 5s. Lesson 4: Skip count backwards by 5s (500 – 100) Lesson 5: Skip count forwards by 10s (100 – 1000) Lesson 6: Skip count backwards by 10s (1000 – 100)	16 - 23	5 - 7	4 4 -5 5 5 -6 6 6 - 7
Module 3: Counting to find “how many”	Lesson 1: Counting by 2s to find “How Many” Lesson 2: Counting by 5s to find “How Many” Lesson 3: Counting in 10s to find “How Many.	25 - 28	8 - 10	8 8 - 9 9
Module 4: Representing Quantities with Numerals	Lesson 1: Representing quantities of objects with numerals (1 – 100) Lesson 2: Representing Quantities with numeral (100 – 1000)	29 - 32	11 - 12	10 11
Module 5: Estimating quantities	Lesson 1: Finding Estimates	33 - 35	13 - 14	12
Module 6: Describing the Position of Numbers	Lesson 1: Describing position of numbers.	36 - 38	15 - 17	13
Module 7: Using non-standard units for measuring (1)	Lesson 1: Counting to find “How long” (using objects) Lesson 2: Counting to find “How long” using (using body parts)	39 - 42	18 - 20	14 15
Module 8: Using non-stand and ... (2)	Lesson 1: Counting to find “How Much?”.	43 - 44	21	16

Module 9: Place Value	Lesson 1: Place value of 2-digit numbers Lesson 2: Place Value of 3-digit numbers	45 - 48	22 - 24	17 18
Module 10: Partitioning of whole Numbers	Lesson 1: Partitioning of 2-digit numbers Lesson 2: Partitioning of 3-digit numbers	49 - 52	25 - 26	19 19 - 20
Module 11: Describing numbers in equivalent ways	Lesson 1: Numbers more than or less than Lesson 2: Describing numbers in Equivalent Ways	53 - 55	27 - 28	21 22
Module 12: Arranging objects in Different ways	Lesson 1: Equal Groupings of objects Lesson 2: Grouping objects with left overs.	56 - 60	29 - 31	23 24
Module 13: Comparing whole numbers using the symbol $>$, $<$ or $=$	Lesson 1: Comparing 2 Numbers	61 - 62	32 - 33	25
Module 14: Ordering whole numbers	Lesson 1: Ordering numbers	63 - 65	34 - 35	26
Module 15: Finding missing numbers	Lesson 1: Finding missing numbers using the number line Lesson 2: Finding missing numbers using the 100 number chart	66 - 69	36 - 37	27 28
Module 16: Word Problem Involving Comparison	Lesson 1: Word problem (comparison)	70 - 72	38	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
Module 1: Addition of whole numbers.	Lesson 1: Adding 2 numbers in any order	76 - 78	40 - 41	31
	Lesson 2: Adding 3 numbers in any order			32
Module 2: Adding or subtracting zero	Lesson 1: Adding or Subtracting Zero (0) from a number	79 - 81	42 - 43	33
Module 3: Finding Missing numbers.	Lesson 1: Finding missing addend	82 - 85	44 - 46	34
	Lesson 2: Find missing subtrahend			35 - 36
Module 4: Addition and subtraction word problem.	Lesson 1: Creating addition sentence and word problems for a given solution/answer.	86 - 90	47 - 49	37 - 38
	Lesson 2: Creating subtraction sentences and word problems for a given solution			38
Module 5: Addition and subtraction of whole numbers using “= and ≠” signs	Lesson Lesson 1: Addition of whole numbers (sum up to 100)	91 - 93	50 - 52	39 - 40
	Lesson 2: Subtraction of whole numbers (within 100)			40
Module 6: Relationship between addition and subtraction	Lesson 1: Changing Addition sentences to subtraction sentences	95 - 96	53 - 55	41 - 42
	Lesson 2: Changing Subtraction sentences into addition Sentences.			42
Module 7: Addition and subtraction facts (fluency 1)	Lesson 1: Addition Facts (1, 2 or 10 less than/more than).	97 - 99	56 - 57	43
Module 8: Double of numbers (1 – 12)	Lesson 1: Finding doubles of a number	100 - 101	58 - 59	44
Module 9: Addition and subtraction facts (fluency 2)	Lesson 1: Number bond for 10	102 - 105	60 - 61	45
	Lesson 2: Number bonds for 15, 19, 20)			46

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

Module 19: Word problem involving subtraction (within 100)	Lesson 1: Subtraction (using place value) Lesson 2: Changing subtraction sentences to addition sentences. Lesson 3: 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
Module 1: Making halves	Lesson 1: Making halves. Lesson 2: Counting Halves	151 - 154	95 - 96	70 - 71
Module 2: Making quarters	Lesson 1: Making quarters Lesson 2: Counting quarters	155 - 158		72 72 - 73
Module 3: Halves and quarters of an amount	Lesson 1: Identifying half of amount (1) Lesson 2: Identifying half of amount (2) Lesson 3: Identifying quarter of amount (1) Lesson 4: Identifying quarter of amount (2)	159 - 162	100 - 101	74 75 75 75 - 76

Strand 1: Number Sub-strand : Money

Module	Lessons	LB page numbers	WB page numbers	TG page numbers
Module 1: Recognising Ghanaian coins and notes by name	Lesson 1: identifying the Ghana pesewa coins. Lesson 2: identifying 1, 2 and 5 Ghana cedi notes Lesson 3: Identifying the 10, 20 and 50 Ghana cedi notes	165 - 168	102 - 103	77 78 78
Module 2: Relationship among the Ghana cedi notes	Lesson 1: Relationship among the Ghana cedi notes (1) Lesson 2: 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
Module 1: Increasing and decreasing number patterns	Lesson 1: Increasing number patterns	176 - 181	108 - 110	82
	Lesson 2: Decreasing number pattern			82
Module 2: Identifying errors/omissions in patterns	Lesson 1: Identifying Errors in patterns increasing in 2s	182 - 184	111 - 112	83
	Lesson 2: Identifying Errors in patterns decreasing in 5s			83 -84
	Lesson 3: Identifying errors in patterns increasing by 10			84
Module 3: Finding missing terms in pattern	Lesson 1: Repeated addition pattern	185 - 186	113 - 114	85
	Lesson 2: Repeated subtraction pattern			85 - 86
Module 4: Identifying and describing rules for patterns	Lesson 1: Finding rules for addition patterns	187 - 190	115 - 118	87
	Lesson 2: Finding rules for subtraction patterns			87 - 88
	Lesson 3: Finding rules for arrays of objects			88

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

Module 4: Sorting 2D shapes	Lesson 1: Sorting 2D shapes by type Lesson 2: Sorting 2D shapes by colour	207 - 209	127 - 128	97 97 - 98
Module 5: identifying 2D shapes in everyday objects	Lesson 1: 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
Module 1: Different orientations of shapes	Lesson 1: Describing different orientations of shapes (1) Lesson 2: Describing different orientations of shapes (2)	214 - 216	131 - 132	101 101-102

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
Module 1: Measuring Lengths	Lesson 1: Comparing length (1) Lesson 2: Comparing length (2)	218 - 220	133 - 134	103 103 -104
Module 2: Measuring Mass	Lesson 1: Comparing the weight of object (1) Lesson 2: Comparing weight of object (2)	221 - 224	135 - 136	105 106
Module 3: Measuring capacity	Lesson 1: Comparing capacity (1) Lesson 2: Comparing capacity (2)	225 - 227	137 - 138	107 108
Module 4: Comparing 3 or more objects.	Lesson 1: Comparing 3 or more objects	228 - 231	139 - 141	109
Module 5: Standard unit for measuring length	Lesson 1: Using standard unit for length (1) Lesson 2: Using standard unit for length (2)	232 - 234	142 - 143	110 111 - 111
Module 6: Reading the calendar	Lesson 1: Reading January, February, March, April, May, June Lesson 2: Reading July, August, September, October, November, December	236 - 238	144 - 145	112 112 - 113

Module 7: Measuring time using arbitrary units	Lesson 1: Measuring time using arbitrary units (1) Lesson 2: Measuring time using arbitrary units (2)	239 - 241	146 - 147	114 115
Module 8: Relationship between units of time	Lesson 1: Relationship between units of time (1) Lesson 2: Relationship between units of time (2) Lesson 3: Relationship between units of time (3) Lesson 4: Seconds, minutes and hours Lesson 5: Days, weeks, months and years	242 - 247	148	116 116 - 117 117 117 117 - 118

Strand 4: Data

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

Module	Lessons	LB page numbers	WB page numbers	TG page numbers
Module 1: Collecting and organising data	Lesson 1: Collecting data (objects) Lesson 2: Collecting data (tally)	252 - 256	154 - 156	120 120 - 121
Module 2: Interpretation of graphs	Lesson 1: Interpretation of graphs 1 Lesson 2: 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 it 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 history 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 it 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.

Number

1

Sub-Strand

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

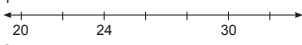
- Give out 100-number charts. They count forward by 2s starting from any number up to 60.

Assessment for Learning

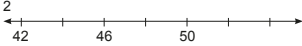
- Refer learners to exercise 1 page 18 of their Learner's Book.

Suggested Homework
Write the missing numbers.

1



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.

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.

New words

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

Number of Lessons

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

Content Standard

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

Indicator

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

Review Exercise

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

Suggested Homework

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

Learner's Book page 49
Workbook page 25

Sub-Strand 1 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 tens 8 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 → 20 + 20 + 5 or 40 + 5 or 10 + 10 + 10 + 5. 2) 68 → 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.

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 → 7 2) 5 → 5
3) 2 → 8 4) 7 → 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*)

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.

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.

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.
 - $35 - 19 = ?$
 - $32 - 18 = ?$

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	4. 220	210	200	195
Sub Strand 1: Number: Counting, representation, cardinality and ordinality	5. 140	135	125	120
	6. 295	280	275	270
	7. 450	445	440	430 425
Module 1: Number names	Exercise 5	page 22		
Exercise 1	page 14	1. 30	50	80
1. 11 Eleven		2. 110	130	140
2. 13 Thirteen		3. 530	550	570
3. 16 Sixteen		4. 860	890	900
4. 19 Nineteen		5. 950	960	980 1000
Exercise 2	page 15	Exercise 6	page 23	
1. Eighty five		1. 220	200	180
2. Forty nine		2. 490	470	450
3. Sixty nine		3. 692	682	672 662
4. Ninety six		4. 990	980	970 960
5. One hundred		5. 900	890	880 870 860
Exercise 3		Module 3: Counting to find "how many".		
746 – Seven hundred and forty six		Exercise 1	page 26	
164 – One hundred and sixty four		1. a. 14		
823 – Eight hundred and twenty three		b. 28		
291 – Two hundred and ninety one		2. a. 18		
912 – Nine hundred and twelve		b. 36		
		3. a. 26		
		b. 52		
		4. a. 20		
		b. 40		
Module 2: Counting sequence		Module 2 Counting sequence		
Exercise 1	page 18	Trial 1	page 5	
1. 6 8 12		22 26 28 32 34 38 40		
2. 2 6 8 10		42 44 48 50 54 56 58		
3. 14 16 20 22		60 64 66 70 72 76 78		

Workbook

ANSWERS

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	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					
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					

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.

27 Which holds more liquid? Write the letter.

28 Which holds less liquid? Write the letter.

REVISION EXERCISES - From Basic 1

4 Describe the positions of the circled numbers.

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.

Example:

6

7

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: 4

Data

Strand: 1

Number

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 **1** NUMBER: COUNTING, REPRESENTATION, CARDINALITY AND ORDINALITY

Module 1 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

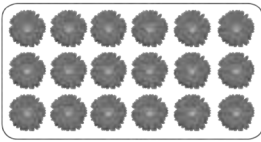
<p>N</p> <p>nine being one more than eight</p> <p>ninth coming next after the eighth position and before the tenth position</p> <p>number give numbers to nothing not anything; no thing</p> <p>number bond the relationship between a number and the part that combines to make the number</p> <p>numeral a symbol used to represent number</p> <p>O</p> <p>one being a single unit</p> <p>one less being fewer than the other by one</p> <p>one more being more than</p>	<p>P</p> <p>pairs a set of two similar things considered as a unit</p> <p>part a portion of an object</p> <p>pattern graphical representation of a structure in a particular way</p> <p>pesewa a Ghanaian currency name</p> <p>plus sum/add</p> <p>position the spatial property of a place where or way in which something is situated.</p> <p>R</p> <p>rectangle a parallelogram with four right angles</p> <p>remainder something left after other parts have been taken away or the number that remains after subtraction</p> <p>repeat do over, occur again,</p>
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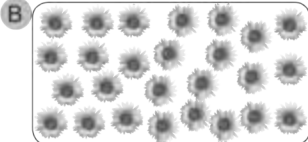
Find out

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

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

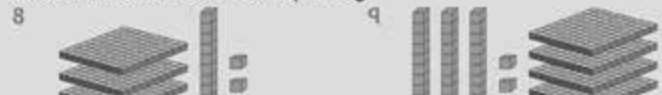
		45	50
--	--	----	----
- 6

100		80	
-----	--	----	--

 7

	70	80	
--	----	----	--

Write the numeral for each quantity.



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 ...			
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.			
partition 2- and 3-digit numbers.			

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

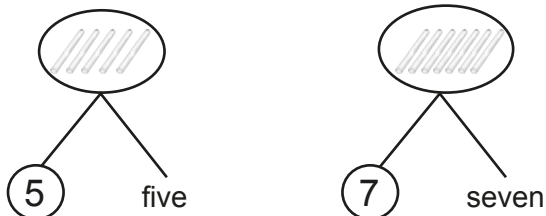
Learners count 1–20 forwards and backwards.

Find Out

Refer learners to page 10. Learners count and write the number of objects in A which are 18 and the number of objects in B, which are 26.

Let us Learn

- Learners work in pairs, one person counts number names from 1–20 forward and the other person 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 page 10 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 their 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 while simultaneously clapping their hands.

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 page 12 of the Learner's Book. Go through the exercises 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 their Learner's Book.

Suggested Home Work

Write number names for these numerals:

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



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

Starter

Learners count by tens from 10–100 forward and backwards and 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 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 their 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 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

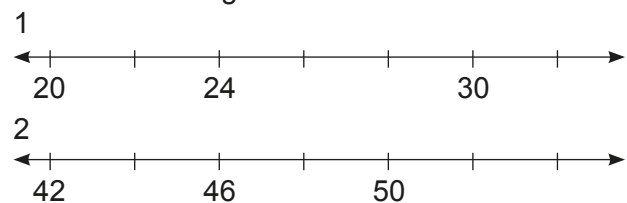
- Give out 100-number charts. They count forward by 2s starting from any number up to 60.

Assessment for Learning

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

Suggested Homework

Write the missing numbers.



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.

- Refer to the Learner's Book page 17 Have Learners count backwards in 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 their Learner's Book.

Suggested Homework

- 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. Have learners count forwards by 10s. Learners count by 10s starting from coloured numbers 105, 115, 125, ...

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 Learners book page 17 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 500.

Review Exerciss

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

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

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

Starter:

Play "Making 10's. Mention a number and ask learners to call out a number which adds up to 10. Eg. 1) $1 \rightarrow 9$ 2) $3 \rightarrow 7$

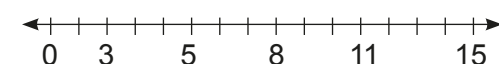
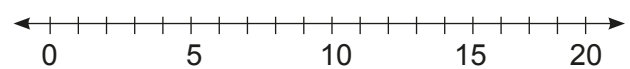
- 3) $4 \rightarrow 6$ 4) $2 \rightarrow 8$

Find Out

Refer learners to page 16 of the Learners' Book. Have learners count backwards by 10s using the reverse of the 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 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 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 their Learner's Book.

Suggested Homework

1. Write multiples of 10, starting from 9 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 from 1 to 20 forwards;

Find Out

Refer to the Learner's Book page 24

Learners look at the bananas. Count by 2s to give 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 table 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. 2 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’ page 24 learners say the total number of items as they skip count by 2s, i.e. A - 12, B - 18.

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

- Learners work in pairs. Give out the 50 number charts to learners. They skip count by 2s from 2 up to 50. They should start from different numbers.

High Ability Learners

- Give out the 100 number charts to learners. Working in pairs, learners skip count by 2s starting from 2 up to 100. They should start from different numbers.

Assessment For Learning

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

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**

Clapping simultaneously, learners count forwards by 2s from 2 up to 10.

Let Us Learn

- Group 20 books by 5s on a table. Pick 1 group and learners count it as 5. Keep

on adding the other 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, collaboration learning**)

- Have learners group themselves by 5s outside the classroom. After that, they count in fives to know the total number of learners in the class.
- Refer to the Learner's Book page 25. Have learners count by 5s to know the total number of circles and rabbits.
- Refer learners to the chart at page – Let Us Learn 2. Learners count by 5s in rows. 305, 310, 315, etc. (**Collaborative learning**)

Review Exercise

Differentiated Lessons

Low Ability Learners

- Have learners work in pairs. Give the 100 number chart to them. They count by 5s from any number up to 100.

High Ability Learners

- Give pairs of learners a 1000 number chart. They skip count by 5s, starting from any number.

Assessment For Learning

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

Suggested Home Work

1. Give out a 100 number chart to each learner. They skip count by 5s and write the numbers from 30 up to 100.

Lesson 3: Counting in 10s to find "how many"

Starter

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

Let Us Learn

- Call a girl and a boy to the front of the class. They put all their fingers together

and show them to the class. Have learners skip count by 10s and say the total number of fingers, i.e. 20. Call 8 more learners to join them. They all hold up their fingers.

The class skip count by 10s to find the total number of fingers of the 10 learners: 10, 20, 30, 40, 50, 60, 70, 80.

- Group learners in fives and give them 100 straws. They count by 10 and bundle them. They display them on the table and count in 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.
- Let Us Learn 3. Learners count the number of circles and bundles of sticks and write the total number. Refer them to the chart. Let them count in 10s in rows.

Review Exercise

Differentiated Lessons

Low Ability Learners

- Have learners work in pairs. Give them 100 number charts. They count by 10s from 2 and 4 up to 100.

High Ability Learners

- Give learners a 1000 number chart. Learners working in pairs count by 10s from 500 and 550 up to 1000.

Assessment for Learning

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

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 written 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 to make up five, e.g. 1) $1 \rightarrow 4$ 2) $3 \rightarrow 2$ 3) $0 \rightarrow 5$

Find Out

Refer to page 29. 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 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 of learners. Mentions 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 up to the number 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 match it. (**Critical thinking, collaborative learning**).

Assessment for Learning

Refer learners to page 31 of their Learners Book for exercises.

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 learners to page 30. Learners count the multibase block up to 1000. Working in groups of 5, learners mention a number randomly from 100 to 1000. Learners write the numeral for that 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 pairs, one learner mentions a number from 100–1000 and the other learner writes it on a sheet of paper. Learners should change over in their groups. A learner mentions a number from 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 their 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.

- | | |
|----------|------------|
| 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 (**Critical thinking, collaborative learning**)
- Refer to page 31 and 32 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 exercises.

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. Learners describe the position where he/she is sitting in relations to other learners.
Examples:
 - Kwame is sitting left of Mawusi.
 - Afia is sitting 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 the Learner's Book page 36. Go through the questions with learners. They should describe the number 32 in different ways.
- Give out number charts like ones on page 37 to each group. One selects a number and the rest describe the position. (**Critical thinking and collaborative learning**)

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

- Have learners sit in groups. Give each group a 4 by 4 grid. The leader selects a number from 1 to 50 and the rest describe 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. One after the other, they describe the position of that number in 3 different ways. (Leadership skills, **critical thinking and collaborative learning**)

Assessment for Learning

Refer learners to page 38 of their Learner's Book for exercises.

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 to 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.

Let us Learn

- Put learners into groups of five.
 - Group 1:** Use straws to measure the length of the board.
 - Group 2:** Use crayons to measure the length of the teacher's table.
 - Group 3:** Use paper clips to measure the length of their tables.
 - Group 4:** Use sticks to measure the length of the veranda in front of their class room.
- Each group tells how many times they used the objects to measure the items. (**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 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 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 exercises.

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 have had to use body pan to measure their items. 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, learners use strides to measure the lengths and width of the school block.
- Ask learners should use their strides to measure, they count to find the differences in the number and justify why that differences. Example: (Some learners are tall and their strides are long whereas shorter learners have short 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

1. Learners use their forefinger to measure the length of their door. They write the number down.
2. 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 Learners guess the number of of sand spade will fill the bucket. They should justify their answers. (Critical thinking, collaborative learning, justification of ideas)

Let us Learn

- Put learners into groups of five. Give them two different sizes of container. They fill the bigger containers with water using the smaller one and state the number of times used to fill it.

Group 1: Milo tin and a bucket.

Group 2: 500 litre 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 milk 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 page to of their 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 tea cup and a bowl. They use the tea cup 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 bowl used.

Assessment for Learning

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

Suggested Homework

- Learner use a cup to, fill bucket. They Record the number of cups.
- Learners compare their results the next day. Elicit from learners why they got different in numbers. (**Critical thinking, collaboration 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 initial number makes 10. E.g.

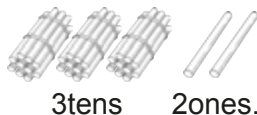
- 1) 2 → 8 2) 6 → 4
3) 1 → 9 4) 5 → 5

Find Out

Refer learners to page 45. 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 a 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 page 45. 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 exercises.

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 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 a number that can add to your number to make 10. E.g.

- 1) 3 → 7 2) 6 → 4
3) 8 → 2 4) 1 → 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 the Learner's Book page 46 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 their 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 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 $10 + 10 + 10 + 10 + 5$. 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**)

- Refer to the Learner's Book page 50. Go through the exercise there 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 their 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 2 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 the Learner's Book page 53. 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 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 7 tens 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 the Learner’s Book page 53. 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 numbers.

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 page 54 of the Learner’s Book and 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 1 on page 55 of their 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

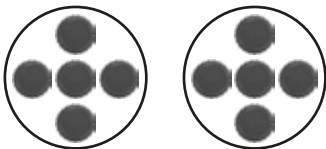
Play "Making 10s". Mention a number and learners say another number to give the sum 10. 1) $6 \rightarrow 4$ 2) $0 \rightarrow 10$ 3) $3 \rightarrow 7$.

Find Out

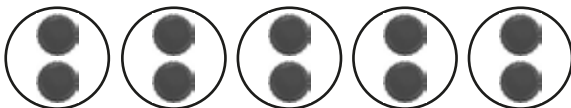
Refer learners to page 56. Deduce from them what they can say about the two groupings. The 15 stars have been re-arranged into 3 equal groups of 5. (Critical thinking, attention to precision)

Let us Learn

- Learners work in groups of five. Give them 10 bottle caps so 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 the Learner's Book page 56–57 (Let us learn 1 and 2). 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 pair. Give out 20 pebbles for them to make 3 different 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 and equivalent groupings of equal numbers. (Critical thinking, collaborative learning)

Assessment for Learning

- Refer learners to page 59 of the Learner's Book for exercises.

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) $2 \rightarrow 8$.

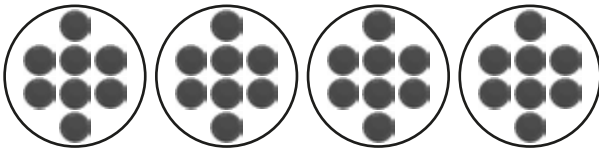
Let Us Learn

- 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 rearrange 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 4, 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 their 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.

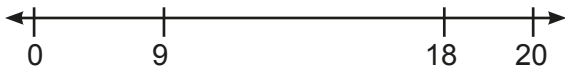
- 1) $9 \rightarrow 8$ 2) $6 \rightarrow 5$
3) $40 \rightarrow 39$ 4) $85 \rightarrow 84$

Find Out

Refer to page 63 Working in pairs, learners compare the prices of the bag and the shoes. They determine which price is more than, 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 $>$ and $<$ symbols cards. They use the cards to compare these numbers:

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

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

- Refer learners to the Learner's Book page 61. 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) $63 \underline{\quad} 66$ 2) $123 \underline{\quad} 231$

High Ability Learners

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

Assessment for Learning

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

Suggested Home Work

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

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

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 groups of 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 their hands at the same time.

Find Out

Refer to the Learner's Book page 61. Learners work in groups to determine the largest and the smallest number. (**Critical thinking, collaborative learning**)

Let us Learn

- Learners work in groups of fives. Give out these numeral cards to learners to arrange in ascending and descending orders.

(1)

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

(2)

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

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

- Now, have learners work in pairs to arrange these numbers in both ascending and descending order.

1) 13, 2, 19, 7 2) 45, 60, 13, 19

(**Critical thinking, Collaborative Learning**)

- Refer to the Learner's Book page 63. Go through the whole exercise with learners.

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

- Working in pairs, learners re-arrange these

numbers 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:

- 1) 32, 17, 28, 41
- 2) 12, 80, 39, 10
- 3) 16, 54, 92, 13
- 4) 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.

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

Find Out

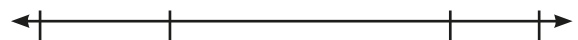
Refer learners to page 66. Learners working in pairs, look at the number line, read out the numbers and give the missing number, which is "4". (**Critical thinking, collaborative, learning, leadership, attention to precision**).

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 to learners to fill in the missing numbers. (**collaborative, learning, critical thinking**)
- Refer to the Learner's Book page 66 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**

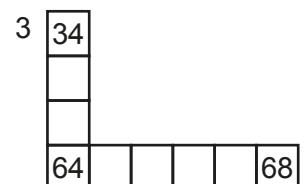
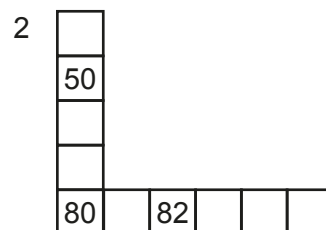
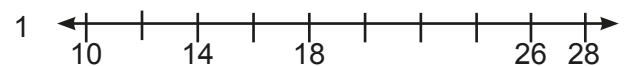
- Give out number line cards from 20 to 50. Leave out 10 numerals for learners to fill in. (Draw)

Assessment for Learning

Refer learners to Exercise 1 on page 68 of their 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 a 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, the numbers increase by 1.
 - Movement to the left, the numbers decrease 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 the numbers (23, 13, 3).
- Let learners look at the movements up and down and discuss what they have discovered.
 - Movement down the numbers increase by 10.
 - Movement up the numbers decrease by 10. (**Critical thinking, collaborative learning, problem solving skills**)
- Refer learners to the learner's Book page 67. 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 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 that involve comparing 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. Learners think critically about how to solve the question. Have learners work in pairs. They write an addition sentence for the problem and use any strategy to solve it, e.g. $26 + 14 = 40$.

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 more 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. (**Critical thinking, collaborative learning**)
- Refer to the Learner's Book page 70. 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 learners (**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 as learning aid. 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 page 69 and 70 of their 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 2 numbers to a 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 page 76 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) $8 + 3 = \square$ 2) $3 + 8 = \square$ 3) $10 + 5 = \square$
 4) $5 + 10 = \square$

- Have learners deduce why they get the same answer. (Critical thinking, collaborative learning)
- Refer to page 76. Working in groups of 4s learners solve the problem $18 + 40 = ?$ and $40 + 18 = ?$ Have learners compare their answers with answers 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 the Learner’s Book page 73 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 the Learner’s Book page 75. Go through the exercises with them;
 $3 + 13 + 2 = ?$,
 $2 + 3 + 13 =$
 $16 + 2 = 18$,
 $5 + 13 = 18$. Repeat this exercise with different numbers. (**Collaborative learning, justification of ideas, attention to precision**)

Review Exercise

Differentiated Lessons

Low Ability Learners

- Give these numbers for learners to solve in pairs:

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

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 76 of their Learner’s Book.

Suggested Homework

Solve these:

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

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

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

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 and explain 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 forward and backwards numbers (1 to 20)

Find Out

Refer learners to page 79 of their 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 5. 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 at 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 the Learner's Book page 79. Go through the activities. Have learners act out the scenario. E.g. "I have 7 balloons; none burst so I still have 7 balloons".
- Refer to Learner's Book page 80 (when you take 0 out of 24 balls, you still have 24 balls). Have learners act some scenarios on their own, e.g. "I have 10 straws"

I've 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.

Review Exercise

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

Differentiated Lessons**Low Ability Learners**

- Have learners work in pairs and solve these;
 - 1) $15 + 0 = \square$ 2) $25 + 0 = \square$
 - 3) $17 - 0 = \square$

High Ability Learners

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

Assessment for Learning

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

Suggested Homework

Work these

- 1) $25 + 0 = \square$ 2) $6 + 0 = \square$
- 3) $10 + 0 = \square$ 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 how many.

Let Us Learn

- Have learners work in groups. Pose word problems for them. E.g. I have 10 note books, the head teacher gave me some more. I now have 16. How many did the head teacher give me?
- Learners write the addition sentence down as follows: $10 + \text{what} = 16$, Learners change the addition sentence into a subtraction sentence and solve it: $10 + \text{ } = 16 \rightarrow 16 - 10 = 6$. The head teacher 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, collaboration learning**).
- Refer learners to 'Let us learn 1' of Learner's Book. Learners solve $32 + ? = 65$.
- Have learners change it into subtraction sentence and solve it.
So $32 + ? = 65$.
becomes $65 - 32 = ?$ $65 - 32 = 33$
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 pages 84 and 85 of the Learner's Book for exercises.

Suggested Home Work

Solve these:

- 1) $33 + ? = 40$
- 2) $28 + ? = 62$
- 3) $82 + ? = 100$
- 4) $75 + ? = 99$

Lesson 2: Find 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) $65 \rightarrow 4$ 3) $88 \rightarrow 87$

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 using several other questions with learners. Learners pose their own word problems. Identify where the subtrahend is and write subtraction sentences for them and solve.

Refer to the Let us Learn: 2 of the Learner's Book page 83. 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?

$$1) 24 - \square = 18 \quad 18 + ? = 24$$

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 away?
- Write one subtraction sentence with a missing subtrahend and solve it.

Assessment for Learning

Refer learners to Exercise 2 on page 85 of their 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: Find 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 the Learner's Book page 82. Have learners say the number of pills on the left hand side of the bottle. Learners guess the number first before counting. Ask how they got the answer. (Actual number of pills 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 $\text{what} - 20 = 25$. 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.

$$1) \square - 10 = 20$$

$$2) \square - 15 = 30.$$

- Refers 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, a 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 page 86. Learners solve the two addition sentences of A in pairs. Have them make 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 show the answer as 72.
- Working in groups of five, learners write two additions sentences for the solution.

$$20 + 52$$

$$42 + 30$$

1) = 72 2) = 72 (**Critical thinking,**

collaborative learning, problem solving skills)

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

- more word problems with a solution of 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 learners book page 87. 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 and 90 for exercises.

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 than”. Mention some numbers and have learners say a number which is 1 less than each of the numbers respectively.

1) 60 → 59 2) 79 → 76 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 number 40 as the difference. Have learners select their own leader to ensure every learner takes part in the discussions. 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 now has 40.
- Refer to the Learner’s Book Page 87 to 88 Go through the example. 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:
- 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 to Exercise 2 on page 90 for exercises.

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 **3**

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.

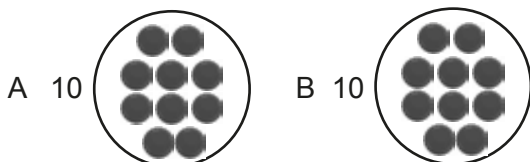
1 0 \rightarrow 10
2 6 \rightarrow 4
3 1 \rightarrow 9

Find Out

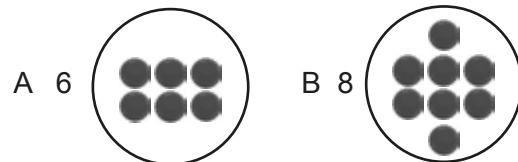
Refer learners to page 91 Learners compare the number of children to the number of bags. Have them observe the picture critically and explain that the bags are not enough for all the children. There are fewer bags than children and more children than bags. (**Critical thinking**).

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. 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.



Similarly, the number of objects in A is not the same as the number of objects in B. A is not equal (\neq) to B. (Critical thinking, collaborative learning)

$20 + 16 = 36$, $30 + 6 = 36$ and $30 = 30$.
Therefore $20 + 16 = 30 + 6$.
 $42 + 12 = 54$, $40 + 12 = 52$. We write $54 \neq 52$.

Refer to the Learner's Book pages 91 and 92 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.

1) $50 - 45$ 2) $65 - 56$ 3) $73 - 73$

High Ability Learners

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

1) $25 + 5$ $\underline{\quad}$ 30
2) $13 + 20$ $\underline{\quad}$ $20 + 31$
3) 60 $\underline{\quad}$ $50 + 10$

Assessment for Learning

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

Suggested Home Work

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

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

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 in 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)

Write the following number sentences on the board. Have learners determine whether the answers are equal to or not equal to. Let them tell you why.

$$\begin{array}{l} 1) 25 = 65 - 40 \quad 30 = 45 - 15 \\ 2) 25 \neq 55 - 25 \quad 30 \neq 40 - 20 \end{array}$$

(Critical thinking, collaborative learning)

Do the following activities with the class.

$$\begin{array}{l} 28 - 16 \text{ and } 37 - 23, \\ \text{b) } 52 - 35 \text{ and } 43 - 35 \\ 28 - 16 = 14 \\ 37 - 23 = 14 \\ 14 = 14 \end{array}$$

$$\text{So } 28 - 16 = 37 - 23 = 14$$

$$\begin{array}{l} 52 - 35 = 17 \\ 43 - 32 = 11 \quad 17 \neq 32 \\ \text{So } 52 - 35 \neq 43 - 32 \end{array}$$

Refer to Learners Book page 92. 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.
 - $46 - 29 \dots\dots 17$
 - $18 - 10 \dots\dots 12$
 - $27 - 17 \dots\dots 10$
 - $33 - 18 \dots\dots 15$

High Ability Learners

- Use the symbols = and \neq to make the number sentence to true.
 - $62 - 38 \dots\dots 38 - 62$
 - $74 - 52 \dots\dots 52 - 38$
 - $77 - 49 \dots\dots 78 - 32$
 - $87 - 43 \dots\dots 100 - 50$

Assessment for Learning

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

Suggested Home Work

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

$$\begin{array}{l} 1) 29 - 18 \dots\dots 18 \\ 2) 47 - 29 \dots\dots 16 \\ 3) 62 - 19 \dots\dots 19 - 62 \\ 4) 74 - 25 \dots\dots 68 - 19 \end{array}$$

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 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 on the number line that represent the answer $20 - \square = 12$
- 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 the Learner's Book page 94. Learners change the addition sentences into subtraction sentences and solve the problems: $14 + \square = 22$ to $22 - \square = 14$
(Critical thinking, collaborative learning)

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

- Change these addition sentences into subtraction sentences and solve the problems. 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 the problems.

- 1) $\square + 17 = 34$ 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. 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. Take the class through solving the problem written on the board while engaging them through questions: $20 - \square = 15$. Have learners explain what that subtraction sentence means. It means $20 - \text{what} = 15$, learners change it into an addition sentence and solve: $20 - \text{what} = 15$ means $\text{what} + 15 = 20$; $15 + \square = 20$.
- Learners count on 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 page 95 of their 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 for exercises.

Suggested Home Work

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

$$(1) 40 - 15 = \square$$

$$(2) 68 - \square = 18$$

$$(3) 65 - \square = 30$$

$$(4) 33 - \square = 26$$

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**

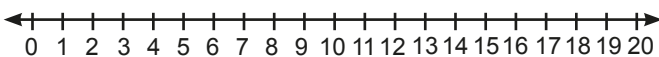
Play "1 less, 1 more". Mention a number and learners give a number which is 1 less and 1 more. E.g. (1) 10, 1 less is 9 and 1 more is 11 (2) 8, 1 less is 7 and 1 more is 9.

Find Out

- Refer learners to the Learner's Book page 97. Learners work in pairs. They look at the ages of Dede and Tetteh and compare them. What can they say?
- Tetteh is 10 years older than Yaba.
- Blay is 1 year older than Dede. Dede is 1 year younger than Blay (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
- 1 more is 15 1 more is 19
2 more is 16
(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 says 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 says 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 95 to 96. 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 page 98 to 99 of their 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 and play “Making 5s and 10s”.

New words

Double, twice.

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

Number of Lessons **1****Lesson 1:** Finding doubles of a number**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 2 pictures and critically compare the number of apples in the bowls. Have learners talk about 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 2 learners (a girl and a boy) to the front of the class. Tell the class you want another group of learners that will double the number standing before the class. Have them discuss how to get the number. After deliberations, they call 2 girls and 2 boys to the front of the class to double 2, which is 4. (**Critical thinking, collaborative learning**)
- Give out straws to group of learners. Call out a number, e.g. 3 and learners in their groups pick 3 straws; Now tell them to double the number of straws. They pick an additional 3 straws and hold them up.
- Have learners play doubles in pairs One calls a number (1 – 10), the other doubles it and holds up straws to show for 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 arrive at 10. (**Critical thinking, collaborative learning, attention to precision**)

- Refer learners to the Learner's Book page 100. 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 at 18, so double of $9 = 18$.

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 to page 101 of the Learner's Book for exercises

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 the Learner's Book page 102.

Learners look at the two hands shown on the page. Learners tell you the number of fingers shown and how many should be added to make 10. Fingers shown is 7. $7 + ? = 10$. $? = 3$. 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/her to yours to make 10. Therefore $6 + 4 = 10$.
- Repeat this activity with 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 the Learner's Book page 102. 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**

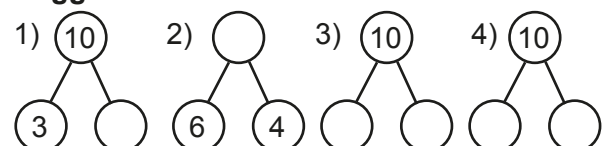
- Working in pairs, learners add another number to make 10.
 - 6 and ?
 - 2 and ?
 - 7 and ?
 - 4 and ?

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 to Exercise 1 on pages 104 and 105 of the Learner's Book for exercises.

Suggested Home Work

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 page 102 in the Learner's Book. In pairs, learners brainstorm to find out the number to replace the question mark. $15 + 4 = 20$. Deduce from learners what must be added to 10 and 5 to make 20. The answer is 15. (*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 give the sum 20, e.g. 10 and 10, 12 and 8, 16 and 4. Learners should find at least 5 sets of 2 different numbers whose sum gives 20. (*Critical thinking, collaborative learning, problem solving skills, attention to precision*).
- Learners find number bonds for these numbers by filling in the empty spaces.

19	
0	
	6
12	
	10
8	

15	
5	
	6
11	
	12

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

- Refer learners to page 103. Take learners through the exercises.
- Number sentences could also be used to match number bonds, e.g.
 $8 + 7 = 19$ $18 + 2 = 20$, $2 + 18 = 20$,
 $20 - 18 = 2$ $20 - 2 = 18$

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 18 and 20.

Assessment for Learning

Refer to Exercise 2 on page 105 for exercises.

Suggested Home Work

Write numerals to complete these number bonds.

19		20		15	

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

Module 10: Addition and subtraction fact (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 make 10s before adding other numbers.

Essentials for Learning:

Learner 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 and clapping at the same time (1 – 20)

Find Out:

- Refer learners to page 106. 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.
 $15 + \text{what} = 20$.

Some learners may count on to get the answer 9. Accept any strategy that the learner may use.

Let us Learn:

- Write the question $2 + 7 + 3 = ?$ In pairs, learners explain how they can solve this question easily. Let learners find out 2 numbers that add up to get 10. That is $7 + 3 = 10$. Now they can count on to add 2 numbers to get the answer 10 (**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 those of 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 Learners Book page 106. Have learners solve $6 + 4 + 3 = \square$. 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 problems. They must first make 10s.
(1) $9 + 6 + 0 =$ (2) $6 + 7 + 4 =$
(3) $6 + 7 + 3 =$

Assessment for Learning

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

Suggested Home Work

Make 10s first to add the following:

- (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 read $6 + 6 + 2$. Double 6, 15, 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 $7 + 7 + 1 = 15$. (**Critical thinking, collaborative learning attention to precision**)
- working in pairs learners do the following exercises, .
- (1) $6 + 7 = ?$
(2) $9 + 8 = ?$
(3) $11 + 10 = ?$

Refer to the Learner's Book page 107. Have learners solve $5 + 6 = \square$

Review Exercise**Low Ability Learners**

- Learners work in pairs using the 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 their 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 $6 + 6 - 1 = 12 - 1 = 11$ (it is subtracted because we added 1 more).
- Put learners into groups of five. Write some numbers 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 the Learner's Book page 107 "Let us learn 3". Go through the exercise with learners.

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

Learners work in pairs to use "+" or "-" and doubles 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 for both + and − .

Assessment for Learning

Refer to Exercise 3 on page 110 of the Learner's Book for exercises.

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. 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 $38 = 30 + 8 - 5 = 33$. 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 page 111. 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 counting down.

- (1) $68 - 9 = ?$ (2) $37 - 8 = ?$ (3) $55 - 7 = ?$

Assessment for Learning

Refer learners to page 113 of the Learner's Book for exercises.

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

Learners count backwards from 20 to 1 and clap.

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 $7 + \text{what} = 15$ $7 + ? = 15$. 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 the Learner's Book page 112. Let us learn 2. $24 - 6 = \rightarrow 6 + ? = 24$
 $6 + ? = 24$
 $6 + 10 = 16$ (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. Solve these:
 (1) $26 - 12 = ?$ (2) $65 - 13 = ?$
 (3) $48 - 29 = ?$

Assessment for Learning

Refer learners to page 114 of the Learner's Book for exercises.

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 numbers up to 100 without grouping.

Essentials for Learning

Learners can do addition with a sum up to 20.

New Words

Group, regroup, tens, ones, add, decompose.

Resources

Bundles of sticks in tens, addition frame, 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. 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 in 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, $25 + 4 = ?$ Thus, when we count on 4: 26, 27, 28, 29. So $25 + 4 = 29$. Give more exercises for learners to practise. (**Critical thinking, collaborative learning, attention to precision**)

(1) $32 + 6 = ?$ (2) $58 + 9 = ?$
(3) $52 + 7 = ?$

The number line could also be used.

To solve it $32 + 6 = ?$ start on 32 and count on 6 to get your answer. So, $32 + 6 = 38$.

Refer to learners book page 115 Go through

the question $82 + 4 = ?$. Learners 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:
(1) $26 + 3 = ?$ (2) $44 + 4 = ?$

High Ability Learners

Solve these:

- (1) $81 + 8 = ?$ (2) $62 + 7 = ?$
(3) $30 + 7 = ?$

Assessment for Learning

Refer learners to pages 119 and 120 of the Learner's Book for exercises.

Suggested Home Work

Solve these:

- (1) $31 + 6 = ?$ (2) $40 + 9 = ?$
(3) $81 + 7 = ?$ (4) $21 + 8 = ?$

Lesson 2: Addition with regrouping**Starter**

Play 'Than 1 more'

Mention a number and learners add 1 more to that numbers.

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 fives. Write an addition sentences on the board. Demonstrate and explain step by step how to solve it. $28 + 6$

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

$$2 \quad \quad \quad 14 \rightarrow (10 + 4)$$

$$2 + 1 \quad \quad + 4 \quad \text{so } 28 + 6 = 34$$

- Give more exercises for learners to work in pairs.

$$(1) 38 + 9 \quad (2) 67 + 6$$

(Critical thinking, collaborative learning, attention to precision)

- Refer learners to page 117 to 118 'Let us learn 2a, 2b and 2c. Go through the exercises with learners. Have learners use the addition frame and the decomposition strategy to solve the exercises.

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

- Working in pairs, learners use the decomposition strategy to solve the problems.

$$(1) 24 + 6 \quad (2) 56 + 8$$

High Ability Learners

- Working in pairs, learners use the addition frame to solve the problems.

$$1) 38 + 9 \quad 2) 67 + 7 \quad 3) 88 + 6$$

Assessment for Learning

Refer learners to Exercise 2 on page 119 of the Learner's Book for exercises.

Suggested Home Work

Use decomposition strategies and addition frame to solve the following:

$$(1) 69 + 4 = \quad (2) 34 + 8 = \quad (3) 88 + 6 =$$

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 grouping within 100.

Essentials for Learning

Learners can do addition with or without grouping with a 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. 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.

$$\begin{array}{r} 25 - 4 = ? \\ \swarrow \quad \searrow \\ 20 + 5 - 4 \\ = 21 \end{array}$$

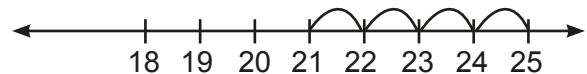
So $25 - 4 = 21$

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 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 the Learner's Book page 121 Go through "Let us learn 1" 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 for exercises.

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 $4 + 3$.
- $40 + 3 - 3 = 40$, $40 - 4 = 36$

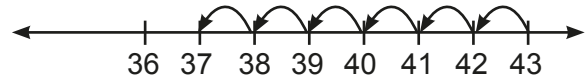
(Attention to precision, critical thinking, collaborative learning)

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 the Learner's Book page 122. 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 121 of their Learners Book for exercises.

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 a number into numbers for easy addition.

Essentials for Learning

Learners can add 2 numbers that 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 a number that, if added to yours 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 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 $40 + 5 + 30 + 3$.

$$(40 + 30) + (5 + 3)$$

$$70 + 8 = 78 \text{ so } 45 + 33 = 78$$

(Critical thinking, collaborative learning, attention to precision)

Let us Learn 1

- Put Learners into groups of five. Write these numerals on the board for learners to decompose:

$$1) \begin{array}{c} 66 \\ \swarrow \quad \searrow \\ 60 + 6 \end{array} \quad 2) \begin{array}{c} 87 \\ \swarrow \quad \downarrow \quad \searrow \\ 20 + 60 + 7 \end{array} \quad 3) \begin{array}{c} 66 \\ \swarrow \quad \downarrow \quad \searrow \\ 40 + 20 + 6 \end{array}$$

Learners use the decomposition strategy to add. $39 + 35$

$$\begin{array}{c} 39 \\ \swarrow \quad \searrow \\ 30 + 9 \end{array} \quad \begin{array}{c} 35 \\ \swarrow \quad \searrow \\ 30 + 5 \end{array}$$

$$30 + 30 + 9 + 5 = 74$$

$$60 + 10 + 4$$

$$60 + 10 + 4 = 74$$

- Repeat this exercise with several other numbers. Have learners work in pairs. **(Critical thinking, collaborative learning)**
- Refer learners to the Learner's Book page 124. Go through the "Let us learn 1" exercise with learners $36 + 25$ and $43 + 39$.

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

- Use the decomposition strategy to add. Work in pairs
- $28 + 31 = ?$
 - $42 + 37 = ?$

High Ability Learners

- Working in pairs use the decomposition strategy to solve these addition sentences
- $64 + 44 = ?$
 - $33 + 55 = ?$

Assessment for Learning

Refer learners to Exercise 1 on page 126 of the Learner's Book for exercises.

Suggested Home Work

Use the decomposition strategy to solve these addition sentences.

$$1) 52 + 37$$

$$2) 26 + 44$$

$$3) 13 + 66$$

$$4) 54 + 34$$

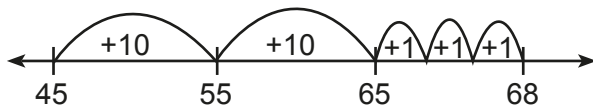
Lesson 2: Addition using friendly jumps

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. E.g. $45 + 23 = ?$



- 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.
 - $46 + 33$
 - $62 + 37$
 - $53 + 27$
- Learners move round to compare how other learners decomposed their numbers find the answers. They correct themselves where they made mistakes. (**Critical thinking, collaborative learning, attention To precision**)

- Refer to the Learner's Book page 125. Go through the question $62 + 25 = \square$. Take learners through the steps.

Assessment for Learning

Refer learners to Exercise 2 on page 127 of their Learner's Book.

Review Exercise

Differentiated Lessons

Low Ability Learners

- Decompose one of these numbers and use friendly jumps to find the answers.
 - $26 + 31$
 - $42 + 37$

High Ability Learners

- Solve these. Use the decomposition strategy and friendly jumps.
 - $48 + 37$
 - $66 + 33$
 - $28 + 76$

Suggested Home Work

Add these numbers, using friendly jumps and decomposition strategies.

- $42 + 17$
- $56 + 32$
- $26 + 44$
- $65 + 36$

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" strategies

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 a number which, if added to you adds 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 page 128. Have learners work in pairs. They explain the strategy they used to get the answers.

(Critical thinking, collaboration 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 $40 + 20 + 4 = 64$.
- Refer learners to page 126. Go through the exercise with them.

- Have learners write $39 + 47$.
 $39 + 47$
 $= 40 + 46$ (move 1 from 46, add it to 39)

 $= 20 + 20 + 6$ (decompose 46 as $20 + 20 + 6$)
 $= 40 + 20 + 20 + 6 = 86$

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 groups.
 1) $38 + 17 = ?$ 2) $58 + 17 = ?$
- Refer learners to the Learner’s Book page 129. 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 to Exercise 2 on page 130 of the Learner’s Book for exercises.

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 the 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. $38 - 16 = ?$

Put learners into groups of 5. Write the following subtraction sentence $18 - 5$ on the board. They should use counting back to solve it. Learners count back 5 places: 17, 16, 15, 14, 13. The answer is 13. (**Collaborative learning, personal development**)

Number lines can 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 the Learner's Book page 131. Go through the questions with learners.

$$\boxed{43 - 19 = ?}$$

Learners change the subtraction sentence to $19 + ? = 43$. 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) $\boxed{28 - 9 = ?}$

2) $\boxed{16 - 8 = ?}$

High Ability Learners

• Work in pairs.

Use the counting back strategy to solve these.

1) $\boxed{25 - 7 = ?}$

2) $\boxed{34 - 12 = ?}$

3) $\boxed{41 - 14 = ?}$

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, collaboration 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 other groups. Learners make connections where necessary. (**Critical thinking, collaborative learning**)

Refer learners to the Learner's Book page 132. 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 page 133 of the Learner's Book for exercises.

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.

E.g. 1) $13 \rightarrow 12$ 2) $25 \rightarrow 24$ 3) $16 \rightarrow 15$

Let Us learn

Put learners into groups of 5.

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) $36 - 53 = ?$ 2) $22 - 46 = ?$

Learners move to other groups and compare the methods used their answers and correct themselves if they got it wrong.

Refer to Learner's Book page 132.

Go through the questions with learners.

$43 - 19 = ?$. Decompose 19 as 10 and 9.

$43 - 10 = 33$

$33 - 9 = 24$ (Decompose 9 as 3 and 6)

$33 - 3 = 30$, $30 - 6 = 24$

So $43 - 19 = 24$

(**Critical thinking, collaboration 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 the 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 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.
 - $35 - 19 = ?$
 - $32 - 18 = ?$

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**Suggested Home Work**

Subtract, using the 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.

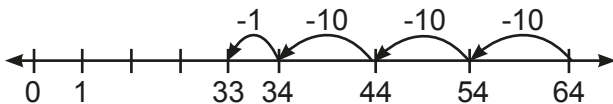
Lesson 2: Subtraction (using friendly jumps)**Starter**

Play "2 less" 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 with learners 33 as $(10 + 10 + 10 + 3)$
 - Subtract 10 three times from 64 $(64 - 10 = 54 - 10 = 44 - 10 = 34)$
 - Now subtract 3 from 34, so $64 - 33 = 31$
- The number line could also be used to do the subtraction.
 $64 - 33$



- 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.
 - $45 - 18 = ?$
 - $56 - 27 = ?$

High Ability Learners

Work in pairs

- $73 - 21 = ?$
- $56 - 37 = ?$
- $84 - 43 = ?$

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)

"Constant difference" is adding or subtracting the same amount from each number to create friendlier combinations.

Put learners into groups of five. Write this subtraction sentence on the board. $64 - 22 = ?$
Explain the procedure as follows to learners.
1) Subtract 2 from each side. The subtraction sentence now becomes $62 - 20 = 22$.

This is very easy. Have learners work these:

1) $57 - 31 = ?$

2) $46 - 22 = ?$

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.

Work through the steps on page 136 of the Learner's Book.

Review Exercise

Differentiated Lessons

Low Ability Learners

- Work in pairs, Subtract: using constant difference strategy.

1) $46 - 22 = ?$ 2) $36 - 19 = ?$

High Ability Learners

- Work in pairs.
- Use the constant Difference strategy to solve these.

1) $44 - 22 = ?$ 2) $66 - 29 = ?$

Assessment for Learning

Refer learners to page 138 of the Learner's Book for exercises.

Suggested Home Work

Solve these subtraction sentences using the constant difference strategy.

1) $75 - 29 = ?$ 2) $73 - 48 = ?$

3) $86 - 68 = ?$ 4) $58 - 39 = ?$

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 number. My number is less than 12 but more than 10. What is my number?

Find Out

Refer learners to page 139 of their books. Have them note the price of the book (GH¢10.00) the amount he has, (GH¢7.00) and 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

- 1) 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, collaboration learning, problem solving skills)
- Refer to the Learner's Book page 139. 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 does Teacher Antwi have?

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 does he have on the 2 farms?

Assessment for Learning

Refer learners to page 142 of the Learner's Book for exercises.

Suggested Home Work

- Selasi has GH¢28 in his pocket. His father gave him GH¢15.00 more. How much has Selasi now?
- 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 the 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)

Find Out

Refer to the Learner’s Book page 139. Count the two groups of oranges there and find the total $16 + 36 = ?$. Deduce from them what strategy to be used. Expected answers would be; counting on, friendly jumps or decomposition. Accept any of them.

Let Us Learn

- In groups of five, have learners solve this $24 + 45 = ?$ using the decomposition strategy.

$$\boxed{24 + 45 = ?}$$

$$24 + 45 =$$

$$20 + 40 + 4 + 5$$

$$60 + 9$$

$$\text{So } 24 + 45 = 69$$

- Give addition sentence cards to learners in pairs. Have learners work on them.

$$1) \boxed{33 + 46 = ?}$$

$$2) \boxed{16 + 58 = ?}$$

- Refer to the Learner’s Book page 141.
- Have learners solve the question $30 + 16 = ?$ 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.

- Agya Ansong brought 58 cocoa pods home. His wife Frempomah also brought 37 pods more. How many pods of cocoa are in the house now?
- 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 now?

Review Exercise

Use the compensation strategy.

Differentiated Lessons**Low Ability Learners**

- Learners work in pairs to solve this.
 - 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 page 142 of the Learner’s Book for exercises.

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 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 to do

subtraction within 100

Essentials for Learning

Learners can use place value to do addition within to 100

New Words

Compensation, count down, count back, count up, backward, forward.

Resources

100 number chart, straws, word-problems cards

Number of Lessons **2**

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 book page 143.

Deduce from learners "How much less the amount needed. They should be able to say the book is GH¢10.00 and the total amount he/she or they have is GH¢7.00. Expected answer could be $\text{GH}¢10 - 7 = 3$ so "how much less" is GH¢3.00.

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 a subtraction sentence for it: $58 - 23 = ?$ Give out the 100 number chart to every group. Starting on 58, move 3 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 and solve these: 1) $62 - 28 = ?$ 2) $44 - 35 = ?$
(Critical thinking, collaborative learning, problem solving skills)
- Refer to the Learner's Book page 144. Go through the exercise with learners: $78 - 35 = ?$ They should say the steps

to use to get the answer 43. 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 page 146 of the Learner's Book for exercises.

Suggested Home Work

Use the number chart to solve these.

- There are 50 pens in a box, 22 are red. How many are blue?
- Alaba went to buy 72 fish at the sea-shore. She sold 67. How many fish are left?

Suggested Home Work

Solve these.

- Mr. Fameyo has 66 coconut trees. He sprayed 38 of them. How many are left to be sprayed?

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.
- 1) Mommy has 30 eggs, 8 got broken. How many are left. $30 - 8 = ?$
- 2) 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 the Learner’s Book page 145.
- Learners read and change the subtraction sentence into an addition sentence ($40 + 25 = ?$). Go through the steps there with learners.
 $40 + 25 = ?$

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: $55 - 18 = 37$.
- 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 we should have, we add 2 to the answer. $55 - 20 = 35 + 2 = 37$
 $55 - 20 = 35$
 $35 + 2 = 37$
So $55 - 18 = 37$
- Refer learners to page 145 of their 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

Differentiated Lessons

Low Ability Learners

- Learners work in pairs: To change the subtraction sentence into an addition sentence and solve it.
1) There are 28 oranges on a tree but 19 dropped from the tree. How many oranges are left?

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 page 147 of their Learner’s Book for exercises.

Suggested Home Work

Change the following subtraction sentences into addition sentences and solve them.

1. Besease DA Primary School has 62 hockey sticks. Fodua DA School borrowed 26.
2. How many hockey sticks are left in the school?
3. There are a number of mangoes in a basket. 38 are rotten, and 19 are good. How many mangoes are in the basket?

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 'half' from a whole.

Essential for Learning

Learners will be able to differentiate a half from a whole.

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. Play "I am counting one, what is one?".

Find Out

Direct learners to page 151 of the Learner's Book 1.

Ask: What can you say about the water melon? Expect answers such as:
1 watermelon
Half a watermelon

Let us Learn:

put learners into groups of about 6

- Direct learners to "**Let us learn 1**" on page 151 of the Learner's Book. Engage the learners to talk about the items.
- Give each group an orange.
- Task groups to cut the orange into two equal halves (Justification of Ideas)
- Present learners with sheets of paper and task them to draw any shape and colour one half of it. (**Critical thinking through justification of ideas**)

Review Exercise**Differentiated lesson****Low Ability Learners**

- Present learners with pictures of objects and task them to shade halves of the objects.

High Ability Learners

- Present learners with pictures of objects and task them to shade halves of the objects.

Assessment for Learning

Refer learners to Exercise 1 on page 152 of the Learner's Book for exercise.

Lesson 2: Counting halves**Starter**

Engage learners to perform some mental math strategies. E.g. Skip count in 5s and 10s.

Group Activities

Direct learners to "**Let Us Learn 2**" in 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 count them and record the number of halves they can count. (**Collaborative learning**)
- Give groups time to present their result and justify their answers. (**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 page 153 of the Learner's Book for exercises.

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 halves of objects 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 pupils can you count? How many will each get if they share 4 items? If each pupil 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 pupils to the front of the class to share four items. Explain that each pupil'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 an orange.
- Task groups to cut the orange 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 pictures of objects and task them to shade quarters of the objects.

High Ability Learners

- Present learners with sheets of papers and task them to draw objects and shade one quarter of each object.

Assessment for Learning

Refer learners to page 157 of their Learner's Books for exercises.

Lesson 2: Counting quarters**Starter:**

Engage learners to perform some mental math activities. E.g. Skip count in 5s and 10s.

Group Activities

Direct learners to "Let us Learn 2" in 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 they get. (Collaborative learning)

- Give 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 they get.

Review Exercise

Differentiated lesson

Low Ability Learners

- Give learners a number, **e.g.** 12. Task them to use paper folding to show 10 quarters.

High Ability Learners

- Give learners a number, **e.g.** 16 quarters. Ask learners to mentally tell how many wholes there are in 16 quarters.

Assessment for Learning

Refer learners to page 158 of their textbook for exercises.

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 are able to identify a half and a quarter, and describe a half and a quarter of a unit 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)

Starters

Engage learners to perform some mental math games. Give them basic facts that can be solved by “making 10s” or “counting up or down” or “making doubles + or – 1 or 2”. Have learners explain how they found their answer.

Find Out

Direct learners to page 159 of the Learner's Books.

Ask: How many learners can you count? How many will each get if they share 4 items? If each pupil gets 1, how will you call it?

Let us Learn:

- Call out two pupils 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. (**Critical thinking**)
- Put learners into 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 to present their result to the class with justifications. (**Collaboration learning**)
- 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.

Review Exercise

Differentiated lesson

Low Ability Learners

- Task learners to divide a given set of items into two equal parts.

High Ability Learners

- Task learners to mentally tell what half of a given group of items is.

Assessment or learning:

Refer learners to Exercise 1 on page 160 of the Learner's Book for exercise.

Lesson 2: Identifying half of amount (2)

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 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.

High Ability Learners

- Task learners to mentally tell what half of a given numbers.

Assessment for Learning

Refer learners to Exercise 2 on page 161 of their books for exercise.

Suggested Homework

1. Draw 6 oranges and put them into two equal parts.
2. Draw 8 squares and divide them into two equal halves.
3. Draw four triangles and colour half of the 4.

Lesson 3: Identifying quarter of amount (1)

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 out 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. (**Critical thinking**)
- 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. (**Collaboration learning**).
- Present learners with sheets of papers and task them to draw a number of items and shade a quarter them.
- Refer to **Let us learn 2** on page 160.

Review Exercise

Differentiated lesson

Low Ability Learners

- Task learners to divide a given set of items into four equal parts.

High Ability Learners

- Task learners to mentally tell a quarter of a given group of items.

Assessment for Learning

Refer learners to page 162 of their learners' book for an exercise.

Refer to learners Wook Book page 100 for exercises.

Lesson 4: Identifying quarter of amount (2)

Put learners into groups of five.

Give learners a table of values:

Number of items	12	24	32	40
Halves				

Task learners to count a number of counters to represent the number items in the table.

Then divide the counters into four equal parts and record how many there are in each quarter.

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.

High Ability Learners

- Task learners to mentally find a quarter of a given number.

Assessment for Learning

Refer learners to page of their textbooks for an exercise.

Suggested Homework

1. Draw 12 oranges and divide them into four equal parts.

2. Draw 16 sticks and divide them into two equal halves.
3. 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 in 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?" (whole' class activity for recognising quantities of 5 or 10).

Starter Activity:

Raise fingers (1 to 5 or 1 to 10).

Ask: How many fingers do you see?

Pupils 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 learners' book 2.

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. (**Collaborative learning**)
- 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. (Personal development)

- Call up each group to make a presentation using the following criteria:
The features on each coin
The colour
- 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 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 page 166 of their textbooks for exercise.

Lesson 2: Identifying 1, 2 and 5 Ghana cedi notes

Let us Learn

- Use the Learners' groups from the previous lesson. (**Collaborative learning**)
- Display the 1, 2 and 5 Ghana cedis 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. (Personal development).
- Call up each group to make a presentation using the following criteria:
- The features on the note (pictures, writings, etc.)
- The colour
- Some items they can buy with the note. (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 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.

High Ability Learners

- Present learners with notes to tell how much more is one note bigger/smaller than the other.

Assessment for Learning

Refer learners to page 167 of their learners' book for exercise

Lesson 3: Identifying 10, 20 and 50 Ghana cedi notes

Let us Learn:

- Direct learners to **Let us learn** on page 164 in their textbooks.
- Revise learners' knowledge on 1, 2 and 5 Ghana cedi notes.
- Use the learners' groups from previous lesson. (**Collaborative learning**)
- 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
- 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 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 exercises.

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" (whole class activity for practising mental fluency with one or two more than a number up to 10 or 20).

Starter Activity

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. (Collaborative learning).
- 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 10 Ghana cedi notes make one 20 cedis. (Justification of ideas)
- Direct learners to **Let us learn** on page 169 in the Learners' Book 1. 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 one number of cedi notes to choose a note that is equivalent to the number of notes. E.g. four of GH¢5 notes make GH¢20.

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)

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 exercises 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 the answers they give. (**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 the Learner's Book page 176 to 175 Go through the exercises with learners.

Review Exercise

Working in groups of four, learners identify the rules and extend the pattern for the next 2 terms.

- 42, 47, 52.....
- 16, 18, 20.....
- 41, 51, 61.....

Assessment for Learning

Refer learners to Exercise 1 on page 179 of their 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.....
- Learners swap over the questions and discuss their answers with the other group members.
- Refer to the Learner's Book page 178 to 179. 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.

Assessment for Learning

Refer learners to Exercise 2 on page 180 of their text books.

Suggested Home Work

Create your own 2 number patterns. Learners should discuss their work the next day.

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 in 2s**Starter**

Have learners sing the song "A circle is a shape".

Find Out

Refer learners to page 182 of their book. Learners look at the pattern in. A critically, 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.

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, 63.

Assessment for Learning

Refer learners to page 183 of their books for exercises.

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 in 5s**Starter**

Learners sing the song "I'm counting one".

Let Us Learn

- Put learners in groups of five. Give out pattern cards for learners to study it 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 their books.

Lesson 3: Identifying errors in patterns increasing by 10

Starter

Learners sing the song "One man went to farm".

Let Us Learn

- Put learners in to groups of five. Write out number patterns on the board and let learners study them and identify the error.

8	18	28	49	38	48
---	----	----	----	----	----

23	33	43	53	60	63
----	----	----	----	----	----

- Learners write their answers and compare them with those of their 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.

42	52	62	70	72
----	----	----	----	----

37	47	57	67	67	86	87
----	----	----	----	----	----	----

- Learners discuss their answers with the whole class.
- The numbers are increasing by 10, but 70 and 86 by 2 and 1 respectively. Therefore, the errors are 70 and 86.
- Refer to the Learner's Book page 183 Have learners go through the **Let us learn 3** exercise and identify the errors.

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.

- 48, 58, 68, 75, 78.
- 35, 44, 55, 65, 75, 80, 85.
- 27, 37, 48, 47, 57.
- 13, 23, 30, 33, 43, 53.

Assessment for learning

Refer learners to page 182 of their books for exercises.

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 for 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

Number of Lessons **1**

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 shapes. The missing number there 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 next number; and the third one is adding 5 to the next number. (**Critical thinking, collaborative learning**)

- Refer to the Learner's Book page 185. Go through the patterns there with learners. (**collaborative learning**).

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, learners 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 their books for exercises.

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 5s, the second one is also decreasing by 5s and the third one decreasing by 2s. (**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 the Learner's Book page 185. 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 1s and 2s. They should work in groups.

High Ability Learners

- Working in pairs, learners create 3 repeated subtraction patterns with decreasing numbers 2, 5 and 10.

Assessment for Learning

Refer learners to Exercise 2 on page 186 of their Learner's Book.

Suggested Home

Work 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 the Learner's Book page 187
Learners find 3 terms of Seidu's patterns.

Let us Learn

- Working in groups of five, learners study these patterns.
 - 1, 3, 5, 7.....
 - 5, 7, 9, 11.....

Learners brainstorm in the 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 page 185 in 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.

- 55, 57, 59, ___ ___
- 38, 37, 35, ___ ___

Assessment for Learning

Refer learners to Exercise 1 on page 189 of the Learner's Book for exercises. of their Learners books for exercises.

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" page 187 Learners work in pairs, study the pattern and continue with the next 3 terms. Alaba is thinking of these numbers (25, 20, 15) (**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. Learners should select a leader (**Critical thinking, justification of ideas, collaborative learning**)
- Refer learners to page 180 of their books. 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 their Learners books.

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 Learners Book page 187. 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 the 1). The second one is kite, rectangle, kite. 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 the Learner's Book page 188. Put learners into groups and go through the activities in Let us learn 3.

Review Exercise

- Give out four 2D shapes to learners individually. (**Personal development, critical thinking justification of ideas**). 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 page 190 of the Learner's Book for exercises.

Suggested Home Work

Use the four ,2D shape to create 3 patterns of your own by drawing and colouring 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 have experience with identifying 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).

Starter Activity:

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.

Activity can be done in pairs, with one partner putting a group of objects and the table of the other partner counting 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**Lesson 1**

- Direct learners to the "Let us learn" section on page 194 in the Learner's Book.
- Point to the solid and drill the names with them.

- Put learners into small groups of about 5 or 7. Task them to identify objects in the classroom and their homes look like the 3Ds objects. (*Collaborative learning*)
- Allow learners time to present their findings quickly to the class.
- Encourage other learners to ask questions for clarification.

Review Exercise**Differentiated lesson****Low Ability Learners**

- Present learners with 3D objects to identify and name.

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 for exercises.

Lesson 2: Attributes of a cube and a cuboid**Let us learn:**

- Use the learners' groups from the previous lesson.
- Give each group a cube and a cuboid and the following criteria by which 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. **(Justification of ideas)**
 - 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.
- Refer to the cube and cuboid in the table on page 195 to the number of faces, corners and edges.

Review Exercise**Differentiated lesson****Low Ability Learners**

- Present learners with a cube and a cuboid and 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 I given criteria.

Assessment

Refer learners to page 196 of their Learner's Books for exercises.

Lesson 3: Attributes of a cylinder and cone**Let us learn:**

- Use the learners' 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 groups to make presentations on their objects to the class using the **criteria (justification of ideas)**.
 - 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.
- Refer to the table on page 195 for learners to compare the number of faces, edges and corners of cylinder and cone.

Review Exercise**Differentiated lesson****Low Ability Learners**

- Present learners with a cylinder and a cone and 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 I given criteria.

Assessment for Learning

Refer learners to page 197 of their learners' books for exercises.

Lesson 4: Attributes of a sphere**Let us learn:**

- Use the learners' groups from the previous lesson.
- Give each group a sphere and some criteria to talk about the object.
 - 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 . **(Justification of ideas criteria)**
 - Encourage other learners to ask questions.
 - Demonstrate how to cut the net of a sphere.
 - Task each group to cut the net to make their own spheres.
 - Refer to the table on page 187 of the Learner's Book

Review**Differentiated lesson****Low Ability Learners**

- Present learners with a sphere and 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 given criteria.

Assessment for Learning:

Refer learners to page 196 of their learners' book for exercise

Lesson 5: Comparing 3D objects**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 object 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 and colour them nicely.

Review Exercise**Differentiated lesson****Low Ability Learners**

- Present learners with a 3D object to describe using 1 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 page 200 of their learners' books for exercises.

Suggested Homework

- Draw and colour a cube and a cuboid.
- Draw and colour two objects that have the shape of a sphere.
- Write any two objects that have a rectangular shape.
- 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 and sort 3D objects.

Essential for Learning:

Learners are able to 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 3D etc.

Number of Lessons **2**

Lesson 1: Sorting 3Ds by type**Starter**

Play "Five (or ten) more/less than..." (whole class activity for practising mental fluency with 5 or 10 more than a number up to 50 or 100).

Starter Activity

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. (**Collaborative learning**)
- 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 pages on which different sizes and colours of 3D objects are drawn.

- Refer learners to Let us Learn on page 200 of the Learner's book. Go through the exercises with them.
- Ask learners to group themselves according to the type of 3D object. Encourage learners to talk about what is common about the groups formed.

Review Exercise**Differentiated lesson****Low ability learners**

- Task learners to match given solid objects.

High Ability Learners

- Task learners to match given solid objects.

Assessment for Learning

Refer learners to page 201 of the Learner's Book for exercises.

Lesson 2: Sorting 3Ds by colour**Let us learn**

- Use the learners' previous groups.
- Give each group a chart showing the different 3D objects in different colours. (**Collaborative learning**)
- Task learners to match the shapes by their colours.

- Play, “race to first”. Put the class into two groups. Give learners cut-out sheets with names of 3D objects.
- Task learners to draw to match the object picked.

Review Exercise**Differentiated lesson****Low Ability Learners**

- Task learners to draw to match? a given shape.

High Ability Learners

- Task learners to draw to match? a given shape.

Assessment for Learning

Refer learners to page 201 of the Learner’s Book for exercises.

Suggested Homework

Draw three cylinders of different sizes and colour each with a different colour.

Draw a cube and a cuboid and colour them 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 and 2D shapes in 3D objects.

Essential for Learning:

Learners are able to 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" (whole class activity for practising mental fluency with 5 or 10 more than a number up to 50 or 100).

Starter Activity

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? Name any real object that you can identify a shape from.

Let us Learn

- Put learners into groups and task them to draw the 2D shapes. (**Collaborative learning**)
- Lead the class to identify the shapes they have drawn.
- Direct learners to **Let us learn 1** on page 202 in the Learner's Book. Drill the names of the plane shapes with the class, (circle, square, rectangle, triangle, hexagon, etc.)
- Using the same groups, task learners to identify objects in and around the class room and identify the 2D shape in it.

Review Exercise**Differentiated lesson****Low Ability Learners**

- Task learners to draw and colour a given 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 page 205 of their Learner's Books for exercises.

Lesson 2: Identifying 2D shapes (2)**Let us learn**

- Use learners' previous groups.
- Give each group a shape and some criteria to use to talk about the shape. (**Collaborative learning**)
Criteria :
name
number of sides
type of face
number of corners
number of vertices
- Have groups do presentations on their shapes to the class using the criteria. (Justification of ideas)
- Encourage other learners to ask questions.

- 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.

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 page 206 of their Learner's' Book for exercises.

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.
3. How many sides are in three hexagons?
4. How many corners are in a rhombus?
5. Complete the table.

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 2D shapes 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).

Starter Activity

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?

Let us Learn

- Put learners into groups of six.
- Present each group with a picture/chart showing plane shapes of different colours and sizes. (**Collaborative learning**)
- 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.

- Refer learners to page 207. Go through activity of Let us Learn with learners.

Review Exercise**Differentiated lesson****Low Ability Learners**

- Task learners to match given plane shapes.

High Ability Learners

- Task learners to match given plane shapes.

Assessment for Learning

Refer learners to page 209 of their books for exercises.

Lesson 2: Sorting 2D shapes by colour**Let us learn:**

- Use the learner's previous groups.
- Give each group a chart showing the different 2D shapes in different colours (**Collaborative learning**)
- Task learners to match the shapes using colour.
- Play, “Race to first”. Put class into two groups. Give learners cut-out sheets with names of 2D shapes.
- Task learners to draw shapes to match what they pick.

Review Exercise**Differentiated lesson****Low Ability Learners**

- Task learners to draw to match to a given one.

High Ability Learners

- Task learners to draw shapes to match to a given one.

Assessment for Learning

Refer learners to page 209 of the Learner's Book for exercises.

Suggested Homework

1. Draw three hexagons of different sizes and colour each a differently 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 are able to 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).

Starter Activity

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 shape in it.

Let us Learn:

- Direct learners to **Let us learn** in Learner's Book.
- Discuss the shapes in the objects.
- Put learners into groups (**Collaborative learning**).
- Present learners with objects such as coins, mathematical sets, chalk boxes, chocomilo cubes, etc. They talk about the shape they see and write it down.

Objects	Coins	Mathematics set	Chalk box	Exercise book	Triangular set square
shape					

Note: Learners can trace the shapes.

- Present groups with newspapers and magazines. Task learners to look for images of objects and to identify the 2D shapes in those objects.
- Refer learners to page 208 of the Learner's Book. Go through the activities with them.

Review Exercise**Differentiated lesson****Low Ability Learners**

- Task learners to write names of objects and their corresponding 2D shapes.

High Ability Learners

- Have learners tell the shape they see in a given 3D object. For example; what is the shape of the top of the teacher's table?

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 shapes of those objects in their note 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.

Essential for Learning

Learners have experience with identifying and naming 2D shape 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).

Starter Activity:

Have learners put objects on their table or put some large objects on a table in the 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 item 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 of the same height, demonstrate to learners that the heights of the straws are the same even in different orientations.
- Direct learners to the **Let us learn** section on page 214 in the Learner's Book.
- Discuss the shapes by identifying those

that are the same.

- Put learners into groups of 5 or 7.
- Present them with a drawing of different 2D shapes in different orientations.
- Task learners to identify all of a given 2D shape.

Review Exercise**Differentiated lesson****Low Ability Learners**

Learners to identify the position of objects in relation to other objects.

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 exercises.

Lesson 2: Describing different orientations of shapes (2)**Let us learn:**

- Use the learners' groups from the previous lesson.
- Revise learners' knowledge on describing objects in different orientations.
- Task learners to draw a 2D shape, e.g. a triangle, in different orientations. (**Collaborative learning**)

- Present groups with magazines to identify shapes in different orientations.

Review Exercise**Differentiated lesson****Low Ability Learners**

- Learners identify shapes in different orientations.

High Ability Learners

- Learners draw shapes in different orientations.

Assessment for Learning

Refer learners to page 214 of their textbooks for exercises.

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 are able to count in 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).

Starter Activity

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 what the person is doing with the feet? Is there any other way we can measure?

Let us Learn

- Direct learners to the **Let us learn** section on page 218 in the Learner's Book.
- Discuss the activities in the pictures.
- Questions
 - 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 objects and record the number of counts.

High Ability Learners

- Task learners to select the best among given measuring items to measure a given object. E.g. To measure the cupboard, would you use a pencil or paper clip?

Assessment for Learning

Refer learners to page 219 of their books for exercises.

Lesson 2: Comparing length (2)**Let us learn:**

Use the Learners' groups from previous lessons.

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.

(Collaborative learning)

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. (*critical thinking*).

Review Exercise

Differentiated lesson

Low Ability Learners

- Learners tell how many pencils or match sticks will measure a given item.

High Ability Learners

- Learners tell which item will be the best for measuring a particular object and state why.

Assessment for Learning

Refer learners to page 220 of the Learner's Book for exercises.

Suggested Homework

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

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 are able to 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:** Compare 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).

Starter Activity:

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?

Expected answer: the boy in the green top.

Why do you think he is heavier?

Let Us Learn

- Put learners into groups of five.
- Direct learners to the 'Let us learn' section on page 221 in the Learner's Book.
- Repeatedly take them through the new words.
- 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. (**collaborative learning**)
- Call out groups to present their results and give reasons for their answers. (**Critical thinking**)
- Do a whole class activity.

Activity

- Put pairs of items together and ask learners to tell which is heavier than, lighter than, or same, heavier than, lighter than, or the same.

Review Exercise**Differentiated lesson****Low Ability Learners**

- Learners compare objects and tell which is heavier than or lighter than or the same.

High Ability Learners

- Task learners to arrange given items from heaviest to lightest.

Assessment for Learning

Refer learners to page 223 of the Learner's Book for exercises.

Lesson 2: Compare 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. (**Collaborative learning**)
- Call out groups to present and justify their results. (**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 exercises.

Suggested Homework

Write the names of five different pairs of items and identify which of each pair is heavier or lighter than the other.

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 capacity.

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).

Starter Activity:

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?

Let us Learn

- Put learners into groups of about five.
- Direct learners to the **Let us learn** section on page 225 in the Learner's Book.
- Repeatedly go over the key words with them.
- Guide them to compare things using the right expression.
- 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). **(Collaborative learning)**
- Call out groups to present their results.
- Ask learners to select which container they would prefer to use to fill a bigger container and why. **(Critical thinking)**
- Perform a whole class activity
- Activity
- Hold up or point to pairs of containers for learners to tell which of the two holds more.

Review Exercise**Differentiated lesson****Low Ability Learners**

- Learners compare pairs of containers and tell which holds more or less content.

High Ability Learners

- Task learners to arrange from the most to the least when they are given a number of containers to compare.

Assessment for Learning

Refer learners to page 226 of the Learner's Book for exercises.

Lesson 2: Comparing capacity (2)**Let us learn:**

- Put learners into two groups.
- Do a whole class activity.
- Activity. Put pairs of containers down and ask learners to tell which holds more/less content.
- Task learners to embark on a project to design a hand-washing stand.
Note: The Teacher should help with the design. A simple gallon can be used.
(Collaborative learning).
- Refer learners to Let us Learn: 2 on page 226 of the Learner's Book. Go through the exercises with them.

Review Exercise**Differentiated lesson****Low Ability Learners**

- 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.

High Ability Learners

- Have learners order containers of different sizes, from the biggest to the smallest and determine which holds the most water and the one which holds the least.

Assessment for Learning

Refer learners to page 227 of their textbooks for exercises.

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 objects.

Essential for Learning

Learners are able to count in 1s.

Learners are able to compare the length, of 2 objects and identify the long/short one.

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).

Starter Activity

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

- Direct learners to the **Let us learn** section of the textbook.
- Discuss the various measurement activity in the picture.
- Put learners into groups of about five.
- Task them to measure some items and record their answers for presentation to the class. Learners should tell what type of measurement they are doing. (**Collaborative learning**)

- Have a class discussion on the importance of measurement (**Critical thinking**)

Review Exercise**Differentiated lesson****Low Ability Learners**

- Learners compare lengths, mass and capacity of objects.
- Refer learners to Let us learn 1: on page 226 of the Learner's Book. Go through the exercise with them.

High Ability Learners

- Learners compare and order length, mass and capacity of objects.

Assessment for Learning

Refer learners to page 230 to 231 of the Learner's Book for exercises.

Suggested Homework

1. Measure the length of your kitchen table or bed with a pencil and record it.
2. Compare the mass of pairs of objects and tell which is heavier and which is lighter.
3. Choose two containers, compare their capacities and record which holds more content and 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).

Starter Activity

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. (note: 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 to use for measuring.
- 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 say **that because they used different items for measuring, the results differ.**

- Challenge groups to decide among themselves how they can arrive at the same results when they go back to measure. **Expect learners to all use the same item to measure this time.**
- 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**Differentiated lesson****Low Ability Learners**

- Learners tell why we should measure using a standard unit.

High Ability Learners

- Learners tell why we should measure 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)

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 have a class discussion. (**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 wrong).
- Go round the groups to assist them.
- Task learners to measure the length of the top of their tables individually.

Review Exercise

Differentiated lesson

Low Ability Learners

- Learners measure and record the length of their exercise books, table legs, etc.

High Ability Learners

- Learners measure and record the length of their exercise books, table legs, etc.

Assessment for Learning

Refer learners to page 234 of their learners' books for exercises.

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 January, February, March, April, May, June

Starter

Play “Show me... but in different ways” (whole class activity for practicing 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. 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 their textbook.

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

- Direct learners to **Let us Learn** on page 235.
- 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.

Review Exercise**Differentiated lesson****Low Ability Learners**

- Learners read a date on the calendar.

High Ability Learners

- Learners read a date on the calendar.

Assessment for Learning

Refer learners to page 237 of the Learner's Book for exercise.

Lesson 2: Reading July, August, September, October, November, December

Let us Learn

- Direct learners to **Let us learn** on page 233 and 236.
- Have learners read 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, etc.

Review Exercise

Differentiated lesson

Low Ability Learners

- Learners read a date on the calendar.

High Ability Learners

- Learners read a date on the calendar.

Assessment for Learning

Refer learners to page 238 of their learners' books for exercises.

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 simple event, tale,. 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 "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.

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 239 of the Learner's Book.

Ask: Look closely at the object in the picture. What is it used for?

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. (**Collaborative learning**)

- Call out some pupils 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.
- Discuss with learners the importance of time.

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 tell which activity would take a longer time than the other and about how much longer.

Assessment for Learning

Refer learners to page 240 of their Learner's Books for exercises.

Lesson 2: Measuring time using arbitrary units (2)

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	It takes about..... to wash
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	It takes about..... to sweep

- Allow learners to present their table to the whole class. Learners must give reasons for their answers.
- 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 tell which activity will take a longer time than the other and about how much longer

Assessment for Learning

Refer learners to page 241 of the Learner's Book for exercises.

Suggested Homework

Learners complete the table

Activity	Time it takes
1. Time it takes to eat	
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 **5**

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 the picture? 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 affect each other. (**Collaborative Learning**).
- 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 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 their Learner's Books for exercises.

Lesson 2: Relationship between units of time (2)**Let us Learn**

- Revise the previous lesson on the features of the clock.
- 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 papers and task them to read the time and record it.
- Allow groups time to present their results.
- Refer learners to Let us Learn: 2. Go through the activities with learners.

Review Exercise**Differentiated lesson****Low Ability Learners**

- Learners tell the time on clock faces.

High Ability Learners

- Learners tell the time when told verbally the position of the hour and minute hands.

Assessment for learning

Refer learners to exercise 2 on page 243 of the Learner's Book for exercises.

Lesson 3: Relationship between units of time (3)**Let us Learn:**

- Revise the previous lesson on telling the time.
- Use the learners' groups from the previous lesson. Present each group with a clock.
- Give each group a sheet of paper with a time written on it. Task them to show the time on the clock.
- Note:** Give groups one time sheet at a time. When they show the time on the clock to you then they get another one to work on.
- Give each learner a time sheet and task them to draw a clock face to show the time.

Review Exercise**Differentiated lesson****Low Ability Learners**

- Learners tell the time on clock faces.

High Ability Learners

- Learners draw two clock faces to show the different times of two events.

Assessment for learning

Refer learners to exercise 3 on page 246 of the Learner's Book for exercises.

Lesson 4: Seconds, minutes and hours**Let us learn**

- Revise the previous lesson on telling the time.
- Use the learners' groups from the previous lesson.
- Direct learners to **Let us learn** on page 242
- Discuss the relationships between the units of time.

60 seconds make 1 minutes
60 minutes make 1 hour
24 hours make 1 day

- 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 1minute on it.

Review Exercise**Differentiated lesson****Low Ability Learners**

- Learners can tell the relationship between time units.

High Ability Learners

- Learners explain the relationship between time units when they are doubled. E.g. how many minutes make two hours?

Assessment for learning

Refer learners to exercise 4 on page 247 of the Learner's Book for exercises.

Lesson 5: Days, weeks, months and years**Let us learn**

- Revise the previous lesson on relationships between time units.
- Use the learners' groups from the previous lesson.
- Direct learners to Let us learn on page 245. Discuss the relationships between the units of time.

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

- Learners tell the relationship between the time units.

High Ability Learners

- Learners tell the relationship between time units when they are doubled. E.g. How many days make two weeks?

Assessment for learning

Refer learners to exercise 5 on page 246 of the Learner’s Book.

Suggested Homework

1. Draw clock faces showing the following time.

3:15	8:00
6:30	7:45

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 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 "Pretoa 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. A learner reads and writes the subject on the board (critical thinking, collaborative learning, justification of ideas).
- Our World Our People (OWOP) -
- Maths -
- English -
- French -
- Refer learners to page 252 of their books. They count the different drinks
- and write the total number for each brand.

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

Assessment for Learning

(personal development)

Refer learners to page 255 of the Learner's Book for exercises.

Suggested Homework

Count the number of the following items in your house. Write down the numbers for discussion the next day in class.

1 spoons, bowls, cups, knives

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. (**personal development**)

Colour	Tally	Number
Red		
Blue		
Green		
Yellow		

- Refer to book page 253 and 254 of the Learner's Book. Ask learner's to indicate the drinks they like best. Guide them to put a tally in the columns as they answer the questions.

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 their Learner's Book.

Suggested Homework

Put a tally against the types of people in your house. Filling the total number.

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 shapes of fruits (mango, orange, pawpaw and apple) to learners. Draw the fruits on the board. Have learners identify the fruits they like the best. Use tape to stick the cut-out fruits next to the fruits selected.

Fruits	Number
mango	
Orange	
Paw paw	
Apple	

- Learners working on their own, 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 page 257. Go through the activities with learners.

Review Exercise

Learners work in groups of five. Give each group a table. Learners answer questions based on that.

Type of People	Number
Female teachers	
Male Teachers	
Girls in class	
Boys in class	

- 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 250 of the Learner's Book

Suggested Homework

Count the number of each category of objects group in your house. Learners discuss their in class the next day. (**Personal development**)

Objects made of wood _____.

Objects made of metal _____.

Objects made of plastic _____.

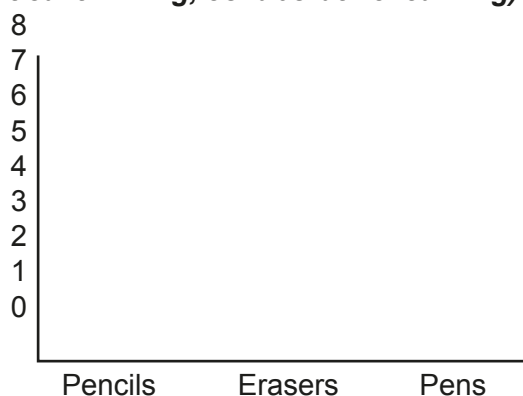
Lesson 2: Interpretation of graphs (2)

Starter

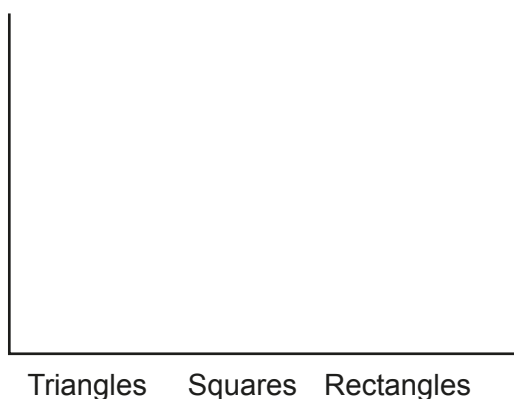
Learners sing the song: "One, two, buckle my shoe".

Let Us Learn

- Put learners into groups of five. Have learners bring out their pencils (8), erasers (9), and pens (6).
- 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 are there erasers than pens?
- Give learners the following cut-out shapes to arrange in a graph: 5 triangles, 8 squares and 11 rectangles.



- Learners ask questions in their groups and compare their answers.
How many shapes are there?
Which shapes are there the most?
How many more rectangles are there than triangles?
- Refer learners to the Learner's Book page 256. Take them through the exercises.

Review Exercise

Give learners bottle caps in different colours. In their groups of five, they draw up a concrete graph to show how many of each colour caps there are.

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 page 261 on the Learner's Book for exercises.

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

- 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
- 2 6 8 10
- 14 16 20 22
- 50 52 54 56 58 60
- 30 32 34 36 38 40
- 47 49 51 53 55 57

Exercise 2 page 19

- 16 14 12 10 8
- 10 8 6 4 2 0
- 60 56 52 48
- 42 40 38 34
- 38 36 34 32 30 28
- 98 96 94 92 90 88
- 52 50 48 46 44 42

Exercise 3 page 20

- 105 115 125 130 140 145
155 160 170

Exercise 4 page 21

- 495 490 485 480 475
- 340 335 330 320
- 405 400 395 380

- 220 210 200 195
- 140 135 125 120
- 295 280 275 270
- 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
- a. 18
b. 36
- a. 26
b. 52
- a. 20
b. 40

Exercise 2 page 27

- 150
- 90

Exercise 3 page 28

- 80
- 150

Module 4: Representing quantities with numerals.**Exercise 1** page 31

- 24
- 132
- 20
- 40
- 140
- 115

Exercise 2 page 32

- 217
- 533
- 660
- 999
- 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 8 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 5. a. hundreds 6. a. ones
b. eighty b. six hundred 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 → 50+2; or 40+12; or 30+22; or 20+32
7. 63 → 60+3; or 50+13; or 40+23; or 30+33
8. 56 → 50+6; or 40+16; or 30+26; or 20+36
9. 83 → 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

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. $45 + \boxed{} = 69$
 $\boxed{} = 24$; he added 24 more cola nuts.
8. $38 + \boxed{} = 82$
 $\boxed{} = 44$; 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 70 11 67 49
After: 38 72 13 69 51
5. Before: 38 23 52 25 15
After: 40 25 54 27 17

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 2 (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. 7
10. 11
- 4 + 5 = 9
- 7 + 5 = 12
- 7 + 12 = 19
- 11 + 7 = 18

Module 12: Addition of whole numbers (sum up to 100)

- Exercise 1** page 119
- 69
 - 33
 - 43
 - 94
 - $32 + 5 = 37$

Exercise 2 page 119 and 120

- $43+6=49$
- $62+4=66$
- $8+35=43$
- $36+8=44$
- $46+5=51$
- $35+8=43$

Module 13: Subtraction of whole numbers (within 100)

- Exercise 1** page 123
- 42
 - 3
 - 14
 - 19
 - 35

Exercise 2

- $15 - 7 = 8$
- $37 - 7 = 30$
- $65 - 14 = 51$

Module 14: Personal strategies for addition (1)

- Exercise 1** page 126
- $40+30+2+6 = 78$
 - $60+20+5+4=89$
 - $20+40+4+9=73$
 - $60+20+4+6=90$
 - $50+20+1+8=79$
 - $60+30+5+1=96$

Exercise 2 page 127

- 52
 $39+10+3=52$
- 79
 $48+30+1=79$
- 82
 $24+50+8=82$
- 84

Module 15: Personal strategies for addition (2)

- Exercise 1** page 129
- 84
 - 41
 - 60
 - 32
 - 73

Exercise 2 page 130

- 41
- 74
- 91
- 87
- 61
- 83
- 81
- 92

Module 16: Personal strategies for subtraction (1)

- Exercise 1** page 133
- $39-13=26$
 - $43-19=24$
 - $54-26=28$
 - $43-13=30$

Exercise 2 page 133

- $45-15=30$
- $54-18=36$
- $94-76=18$
- $29-13=16$
- $34-12=22$

Exercise 3 page 133

- $88-21=67$
- $48-17=31$
- $84-46=38$
- $97-35=62$

Module 17: Personal strategies for subtraction (2)

- Exercise 1** page 137
- $49-27=22$
 - $57-18=39$
 - $84-39=45$
 - $75-27=48$
 - $72-55=17$

Exercise 2 page 138

- $48-21=27$
- $82-43=39$
- $92-37=55$
- $73-55=18$
- $68-24=44$

Exercise 3 page 138

- $42-26=16$
- $65-27=38$
- $96-74=22$
- $83-44=39$
- $58-23=35$

Module 18: Word problem involving addition (up to 100)

- Exercise 1** page 142
- $48+51=99$
 - $66+33=99$
 - $32+57=89$
 - $80+15=95$
 - $62+8=70$
 - $52+26=78$

Exercise 2 page 142

- $42+19=61$ yams
- $47-38=9$ books
- $27+14=41$ oranges

Module 19: Word problems involving subtraction (within 100)

- Exercise 1** page 146
- $51 - 13 = 38$ good snails
 - $35 - 28 = 7$ pens
 - $56 - 39 = 17$ toffees

ANSWERS

Exercise 2 page 147

- 84-65=
84-70=14
14+5=19 → 19 bottle caps
- 73-58=
73-60=13
13+2=15 → 15 mangoes
- 70-55=
70-60=10
10+5=15 → ¢15

Reflection Exercise 3 page 148

- 20
- 55;18
- $10 + 35 + 15 = 35 + 10 + 15$ in any order.
- $10 + 15 + 35 = 35 + 15 + 10$ in any order.
- 40
- 61
- 57
- 50
- 30
- 47
- $98-15 = 83$
- 14. check on learners answers

Reflection Exercise 4 page 149

- ≠
- =
- =
- ≠
- 6
- 25
- 19
- 55
- 18
- 10
- 27
- 27
- 43
- 77
- 75
- 37
- 64
- 0

Strand 1: Number

Sub Strand 3: Fractions

Module 1: Making halves

Exercise 1 page 152

- a
- b
- b
- a

Exercise 2 pages 153 and 154

- 8
- 10
- 6
- 4
- 12
- 22

Module 2: Making quarters

Exercise 1 page 157

a, d, f, g,

Exercise 2 page 158

- 4. check on learners answers
- 8 quarters
- 16 quarters

7. 20 quarters

8. 12 quarters

Module 3: Halves and quarters of an amount.

Exercise 1 page 160

- One-half.
- One-half
- One-half

Exercise 2 page 161

- One-quarter.
- One-half.
- One-quarter.
- three-quarters.
- One-half
- One-quarter
- three-quarters
- One-half

Exercise 3 page 162

check on learners answers

Reflection exercise 5 page 163

- ✓
- X
- ✓
- 6 Check on learners' answers.
- one quarter
- one-half
- three quarters
- one quarter
- three quarters
- one half
- one quarter

Strand 1: Number

Sub Strand 4: Money

Module 1: Recognising Ghanaian coins and notes by name

Exercise 1 page 166

- ¢2
- 50 pesewas
- ¢1
- 20 pesewas
- 60 pesewas
- 80 pesewas

Exercise 2 page 167

- GH¢ 5
- GH¢ 16
- GH¢ 8
- GH¢ 8

Exercise 3 page 166

- C
- A
- B
- A
- C

Module 2: Relationship among the cedi notes

Exercise 1 page 171

- 20
- 4
- 5
- 5

5. 2

6. 2

Exercise 2 page 172

1. ✓ 2. ✓ 3. X 4. X 5. ✓

Reflection exercise 6 page 173

- 5 cedis, 10 cedis, 20 cedis, 50 cedis.
- 20 pesewas, 10 pesewas, 5 pesewas, 1 pesewa.
- 5 cedis, 2 cedis, 1 cedi.
- 5
- 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

- Error 56
- Error 64
- Error 442
- Error 45
- Error 120

Exercise 2 page 184

- 355, 350
- 147, 142
- 769, 764
- 535, 530

Exercise 3 page 184

- Error 15
- Error 56
- Error 442
- 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

- Begin with 8. Make a pattern by adding 5.
8 13 18 23 28 33
- Begin with 17. Make a pattern by adding 2.
17 19 21 23 25 27
- Starting at 20, make a pattern by adding 10.
20 30 40 50 60 70
- Make a pattern by subtracting 10. Begin with 84.
84 74 64 54 44 34

Exercise 3 page 190

- pen pencil book pencil.
- girl girl boy girl.
- spoon fork knife
- □ △
- table, bottle, chair
- check on learners' answers.
- 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.

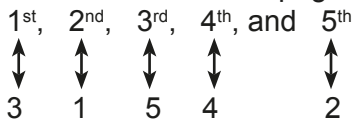
Module 2: Measuring mass

Exercise 1

page 223

- 1) a book 2) b table 3) a cow

Exercise 2 page 224



Module 3: Measuring capacity.

Exercise 1 page 226

1. less than
2. less than
3. more than

Exercise 2 page 227

1 → 4th 2 → 3rd. 3 → 5th 4 → 2nd 5 → 1st

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. 5th March 2019
2. 10th May 2019
3. 15th July 2019
4. 20th December 2019

Exercise 2 page 238

1. March and May
2. April, June, November, September. (any three)
3. 2nd and 30th.

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
2. 5
3. a
4. b
5. Heavy - c heavier - a heaviest - b
6. heavier
7. lighter
8. Colour 1st 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. 9
4. 2
5. 27

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
 930 920 910
 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

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

- Estimate number - Check on learners answer.
Actual number - 83
- 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

- 67
- 34, 29 and 88
- 88
- 26
- 19

Trial 2 page 16

- 877
- 698 and 708
- 475
- 999
- 887

Trial 3 page 17

- 900
- 21
- 159 and 6
- 30 and 54
- 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

- Learners to do these.
- 5

Trial 2

- Eight
- One
- True

Module 9: Place value

Trial 1 page 22

- | | |
|------|------|
| 4 | 6 |
| tens | ones |
 - | | |
|------|------|
| 6 | 2 |
| tens | ones |

- 67
tens ones

6	7
---	---
 - 25
tens ones

2	5
---	---
 - 66
tens ones

6	6
---	---

- 95
tens ones

9	5
---	---
- 44
tens ones

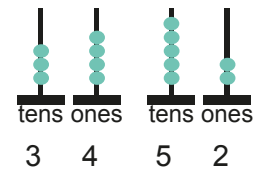
4	4
---	---
- 28
tens ones

2	8
---	---

3. Learners to do these.

Trial 2 page 23

- 3 tens and 4 ones = 34
- 5 tens and 2 ones = 52



- 73 = 7 tens and 3 ones
- 28 = 2 tens 8 ones
- 65 = 6 tens and 5 ones
- 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

- 262
 - 538

Module 10: Partitioning whole numbers.

Trial 1 page 25

- 6 ; 70
- 65
- 50
- 49
- 80 ; 3

Trial 2

- 50 + 0
- 80 + 2
- 20 + 8
- 70 + 3
- 30 + 3

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 page 36

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 | → | 15+30 |
| 2. 10+4 | → | 31+5 |
| 3. 15+30 | → | 19+10 |
| 4. 31+5 | → | 10+4 |

Trial 2

- 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

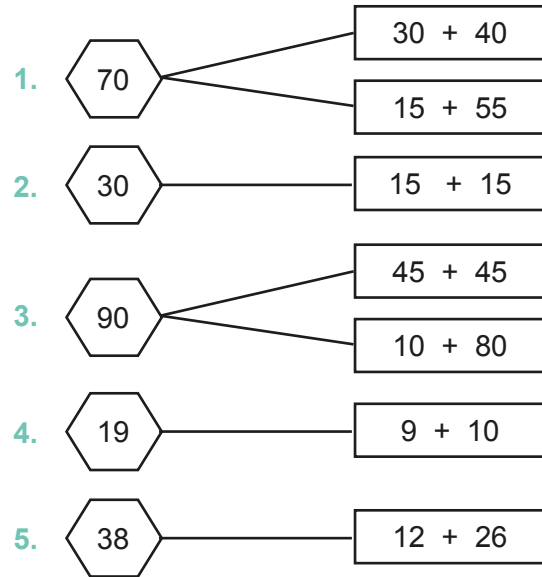
- | | |
|-------|-------|
| 1. 36 | 2. 14 |
| 3. 35 | 4. 29 |
| 5. 52 | |

Trial 3

Check on learners' answers

Module 4: Word problems addition and subtraction.

Trial 1 page 47



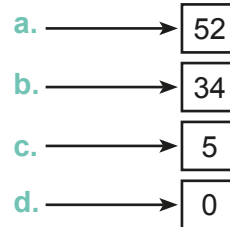
Trial 2 page 48

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

1. \neq
2. $=$
3. $=$
4. \neq
5. \neq
6. $=$

Trial 4

1. 14 2. 25
3. 72 4. \neq
5. \neq

Module 6: Relationship between addition and subtraction.

Trial 1 page 53

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. $48 + 6 = 54$ $54 - 6 = 48$ $54 - 48 = 6$ 3. $85 + 4 = 89$ $89 - 4 = 85$ $89 - 85 = 4$ 5. $51 + 8 = 59$ $59 - 8 = 51$ $59 - 51 = 8$ | <ol style="list-style-type: none"> 2. $63 + 9 = 72$ $72 - 9 = 63$ $72 - 63 = 9$ 4. $37 + 12 = 49$ $49 - 37 = 12$ $49 - 12 = 37$ 6. $70 + 10 = 80$ $80 - 10 = 70$ $80 - 70 = 10$ |
|---|---|

Trial 2 page 54

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. 52 23 75 $52 + 23 = 75$ $75 - 52 = 23$ 2. 27 41 14 $27 + 14 = 41$ $41 - 27 = 14$ 4. 63 25 38 $25 + 38 = 63$ $63 - 25 = 38$ | <ol style="list-style-type: none"> 3. 55 47 8 $47 + 8 = 55$ $55 - 47 = 8$ 5. 79 7 72 $72 + 7 = 79$ $79 - 72 = 7$ |
|---|--|

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

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. 80 89 90 91 100 | <ol style="list-style-type: none"> 2. 3 12 13 14 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

ANSWERS

Module 14: Personal strategies for addition (1)

Trial 1 page 73

1. 69
2. 35
3. 66

Trial 2 page 74

1. 83
2. 83
3. 81
4. 64
5. 81
6. 67

Trial 3 page 75

1. 78
2. 89
3. 72
4. 78
5. 99

2. 13

3. 19

4. 28

5. 36

Trial 2 page 83

1. 11 2. 28 3. 23 4. 19

Trial 3 page 85

1. 24

2. 24

3. 36

4. 9

5. 36

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 2. 81
3. 91 4. 92
5. 94

Trial 3 page 78

Add: use the compensation strategy.

1. 85 2. 62
3. 85 4. 80
5. 82 6. 63

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 16: Personal strategies for subtraction (1)

Trial 1 page 79

1. 17 2. 23
3. 21 4. 15
5. 7 6. 27
7. 19 8. 29

Trial 2 page 80

1. 23 2. 18
3. 18 4. 23

Trial 3 page 81

1. 18 2. 17
3. 17 4. 17

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. $81 - 29 = 52$

Module 17: Personal strategies for subtraction (2)

Trial 1. page 82

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. squares

Trial 2

Learners to do these.

Trial 3 page 101

- 1 - 7 Learners to do these
8. 40
9. 12
10. 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

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

- | | | | |
|-------------------------|---|---|----|
| A Cube | 6 | 8 | 12 |
| B Cone | 2 | 1 | 1 |
| C Pyramid (rectangular) | 5 | 5 | 8 |
| D 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

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 → 3rd b → 5th c → 4th
d → 1st e → 2nd

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

- 10 paper clips 4 pencils
 - 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 2. Stick B = 5cm
- Stick C = 7cm 4. longer
- shorter 6. longer

Module 6: Reading the calendar

Trial 1 page 144

- Learners to do these.
- 10th July 2019 to 16th July 2019.
- 18th July 2019 to 31st July 2019,
14 days 2 weeks.

Trial 2 page 145

- The 3rd 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 page 148

- 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 page 150

- 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
	yelloow 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 page 159

1. Sheep 2. 6
3. 25 4. 4
5. Goats and Cows

Trial 4 page 160

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.

Each lesson plan follows a highly effective lesson structure based on a '**Big idea**', providing an engaging, exciting theme which is endorsed in a real-life context.

The series is designed to ensure that the core values (core competencies) that epitomise the Standards-based curriculum are imbued in learners.

All the indicators have been covered sequentially.

The series consists of a Learner's Book, Workbook and Teacher's Guide for each stage.

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- Clear directives on activities and lesson plans
- Additional recommended activities for better transfer of knowledge
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