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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 visiting 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)
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).

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 measures 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 entrepreneurism; 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) to10.
- 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 enjoyable.
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

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

*Source: NaCCA, Ministry of Education 2019*
## SAMPLE YEARLY SCHEME OF LEARNING – BASIC 12

<table>
<thead>
<tr>
<th>Week</th>
<th>Term 1 (List of term 1 Sub-strands)</th>
<th>Term 2 (List of term 2 Sub-strands)</th>
<th>Term 3 (List of term 3 Sub-strands)</th>
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<tbody>
<tr>
<td>4</td>
<td>Counting, Representation, and Cardinality, Operations, Patterns</td>
<td>Patterns, Operations</td>
<td>Patterns, Operations (Addition and Subtraction)</td>
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<td>5</td>
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<td>Fractions, Representation and Relationship, Patterns, Operations</td>
<td>Money, Patterns, Operations</td>
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<td>Fractions, Representation and Relationship, Patterns, Operations</td>
<td>Money, Patterns, Operations</td>
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<td>Operations Patterns</td>
<td>Fractions, Representation and Relationship, Patterns, Operations</td>
<td>Fractions, Representation and Relationship, Operations</td>
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<tr>
<td>8</td>
<td>Operations Patterns 2D and 3D Shapes</td>
<td>Patterns, 2D and 3D Shapes, Positions and Transformations</td>
<td>Fractions, Representation and Relationship, Operations</td>
</tr>
<tr>
<td>9</td>
<td>Operations, Patterns, 2D and 3D Shapes</td>
<td>Patterns, 2D and 3D Shapes, Positions and Transformations</td>
<td>Patterns, 2D and 3D Shapes, Mass Length and Capacity</td>
</tr>
<tr>
<td>10</td>
<td>Operations, 2D and 3D Shapes, Data</td>
<td>Data Operations</td>
<td>Patterns, 2D and 3D Shapes, Mass Length and Capacity</td>
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<td>11</td>
<td>Operations, 2D and 3D Shapes, Data</td>
<td>Data, Operations</td>
<td>Data Collection, Operations</td>
</tr>
<tr>
<td>12</td>
<td>Operations, Data</td>
<td>Data, 2D and 3D Shapes, Positions and Transformations</td>
<td>Data Collection, 2D and 3D Shapes</td>
</tr>
</tbody>
</table>

*Source: NaCCA, Teacher Resource Pack - 2019*
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**

**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.

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### 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.

### 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

### 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 60 – 1 starting from any number.

#### Let us Learn
• Give out 100-number charts to learners; let them work in groups and in pairs.
Module
This feature is the description of the lessons to be taught. The Module is a broad presentation of the concept that would be taught in a number of lessons.

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

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

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.

---

Introduction

Module: Partitioning of whole numbers

Lesson 1: Partitioning of 2-digit numbers

Start
Say the rhyme “Can you count?” With the whole class.

Find Out
Refer learners to page 49 from their Learner’s Book. Let them decompose the numbers in their groups.

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. E.g. 38 = 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)

Lesson 2: Partitioning of 3-digit numbers

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

Find Out
Refer learners to page 49 of their Learner’s Book. Let them decompose the numbers in their groups.

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. E.g. 258 = 200 + 50 + 8 = 200 + 58. 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)

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.
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.

Answers

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

<table>
<thead>
<tr>
<th>Contents Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>B2.1.2.4: Develop and use conventional and personal strategies for computing additions up to 100</td>
</tr>
<tr>
<td>Indicator</td>
</tr>
<tr>
<td>B2.1.2.4.2: Use personal strategies to add and subtract within 100</td>
</tr>
</tbody>
</table>

**Lesson 1: Subtraction (using compensation)**

**Starter**

Play ‘1 less than’. Say a number and learners subtract 1 from it, e.g. 1) 16 – 15 2) 19 → 18

**Find Out**

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

**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.
- Add 1 to 10 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 = 34.
- Have learners practise more in their groups and in pairs to solve the following problems.

<table>
<thead>
<tr>
<th>Content Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>B2.1.2.4.1: Develop and use conventional and personal strategies for computing additions up to 100</td>
</tr>
<tr>
<td>Indicator</td>
</tr>
<tr>
<td>B2.1.2.4.2.1: Use personal strategies to add and subtract within 100</td>
</tr>
</tbody>
</table>

**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.

**Introduction**

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.

Answers

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

Organisation and structure of the Learner's Book

The user-friendly Learner's Book tackles the new standard-based Mathematics curiculum 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 learners to do them to serve as a recap of what they learnt from Basic 1.

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.

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.
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

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?

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
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.

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.
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.

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.
Strand: 1

Number
Module 1: Number names

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

Indicator
B2.1.1.1: 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).

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)

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.

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.
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 number names for these numerals: 1) 800 2) 720 3) 540

High Ability Learners
• Learners write number names for these numerals: 1) 700 2) 420 3) 790

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: 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.

**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 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
```

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

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

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

**Let Us Learn**
• Give out 100’ number charts to learners; let them work in groups and in pairs.
Starting from any number, have learners count backwards from 60 to 1, moving from right to left. Have learners know that when they move from right to left, they are counting backwards. *(Critical thinking, collaborative learning, attention to precision)*

**Review Exercise**

**Differentiated Lessons**

**Low Ability Learners**
- Give out number line cards to learners. Working in pairs, have them count backwards, starting from 60 to 1. They can start from any number and count backwards.

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

**Assessment for Learning**
Refer learners to Exercise 2 on page 19 of their Learner’s Book.

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

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

**Starter**
Play making 5s. Call out a number and ask learners to call out another number which will add to your number to make 10.

Eg. 1) 4 → 6  2) 3 → 7
3) 3 → 8  4) 1 → 9

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

**Let Us Learn**
- Give learners a 100 number chart. In groups of five, have them skip count forwards by 5s starting from any number and ending at 100. They continue counting forwards up to 200.
- Refer to page 17 of the Learner’s Book. Learners count forwards by 5s up to 500.

**Review Exercise**

**Differentiated Lessons**

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

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

**Assessment for Learning**
Refer learners to Exercise 3 on page 20 of the Learner’s Book.

**Suggested Homework**
Complete the number line.

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

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

Eg. 1) 1 → 4  2) 3 → 2
3) 2 → 3  4) 5 → 0

**Find Out**
Refer learners to page 16 of Learner’s Book. They describe what the girl is doing. She is counting forwards by 5s from 55...

**Let Us Learn**
- Give learners a 100 number chart. Working in groups of 5, learners reverse count by 5s starting from any number.
• 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**
1. Write multiples of 5, starting from 200 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 → 9 2) 2 → 8 3) 4 → 6 4) 2 → 8

**Find Out**
Refer 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: 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.

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
1. 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 100.

Indicator
B2.1.1.1: 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.

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 → 4 2) 3 → 2 3) 0 → 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”

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, justification of ideas, 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)

**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”.

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

1. Learners use any object to measure the length of their door and their dining table.
2. 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?”.

Lessons 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 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 44 of their Learner’s Book for exercises.

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
1. Learner use a cup to fill bucket. They Record the number of cups.
2. 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.

**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.

  ![3 tens 2 ones](image)

- 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 1 hundred. 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).*

**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.

**Tens Frame**

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<thead>
<tr>
<th>Hundred</th>
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<th>Ones</th>
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</thead>
<tbody>
<tr>
<td>5</td>
<td>4</td>
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</table>

- Use the tens frame to explain these numbers:

- 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.

\[
200 + 60 + 5 \\
\
65
\]

• Learners use the place value frame to model it.

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<tr>
<th>Hundred</th>
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<td>6</td>
<td>5</td>
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</table>

• 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.

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 + 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.

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 → 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.

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<tbody>
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<td>5</td>
<td>8</td>
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</table>
• 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:

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.

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”

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. 1) 85 is 5 less than 90. 2) 85 is half of 170. 3) 85 comes before 86 and after 84. 4) 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

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<tr>
<th>Content Standard</th>
<th>Essentials for Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>B2.1.1.1:</strong> Count and estimate quantities from 0 to 1000.</td>
<td>Learners can decompose numbers in different and equivalent ways.</td>
</tr>
<tr>
<td><strong>Indicator:</strong></td>
<td><strong>New words</strong></td>
</tr>
<tr>
<td><strong>B2.1.1.1.5:</strong> Represent number quantities up to 1000 in equivalent ways focusing on place value and equality.</td>
<td>Arrange, different, left over, equal.</td>
</tr>
<tr>
<td><strong>Learning Expectation</strong></td>
<td><strong>Resources</strong></td>
</tr>
<tr>
<td>Learners will be able to arrange objects in different and equivalent ways.</td>
<td>Bottle caps, straws, seeds.</td>
</tr>
</tbody>
</table>

**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 → 4  2) 0 → 10  3) 3 → 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 bottles caps so they make two groupings of equal numbers.

![Equal Groupings](image)

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

![Different Groupings](image)

- 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 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 → 4  
2) 6 → 4  
3) 8 → 2  
4) 2 → 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 to 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.

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 → 8  2) 6 → 5  3) 40 →39  4) 85→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.

1 0 9 18 20

• 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 ___ 86  2. 243 ___ 234  3. 689 _ 649
    (Critical thinking, collaborative learning)

Review Exercise

Differentiated Lessons
Low Ability Learners
• Working in pairs, learners compare these numbers using the correct symbols:
  1) 63 ___ 66  2) 123 ___ 231

High Ability Learners
• Working in pairs, learners compare these numbers using the correct symbols:
  1) 685 ___ 658  2) 729 ___ 829  3) 333 ___ 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 ___ 47  2) 187 ___ 186  3) 582 ___ 588  4) 609 ___ 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.

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

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.

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 → 73 2) 94 → 95 3) 17 → 18 4) 99 → 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.
  1) Movement to the right, the numbers increase by 1.
  2) 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.
  1) Movement down the numbers increase by 10.
  2) 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:
  1. Write 3 numbers below and above 42.
  2. 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.

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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.

**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?

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.

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

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 =
2) 3 + 8 =
3) 10 + 5 =
4) 5 + 10 =

• 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:
  1) 6 + 8 =? and 8 + 6 =?
  2) 10 + 4 =? 4 + 10 =?

High Ability Learners
• Have learners work in pairs and solve these problems: 1) 12 + 8 =? and 8 + 12 =?
  2) 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:
1) 20 + 15 =? and 15 + 20 =?
2) 7 + 9 =? and 9 + 7 =?
3) 17 + 10 and 10 + 17
4) 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) \[6 + 4 + 3 = \quad 4 + 6 + 3 = \]
2) \[9 + 2 + 1 = \quad 1 + 2 + 9 = \]
3) \[16 + 4 + 10 = \quad 10 + 4 + 16 = \]

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.

Lessons

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. Example: 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”

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.

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 =          2) 25 + 0 =
  3)  17 - 0 =

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 =          2) 6 + 0 =
  3)  10 + 0 =          4) 32 + 0 =

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.

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 + what = 16, Learners change the addition sentence into a subtraction sentence and solve it: 10 + = 16 – 10 = 6. The head teacher gave me 6 more notebooks.
• \(20 + ? = 28 \Rightarrow 28 – 20 = ?\)
• \(28 – 20 = 8 \text{ so Esi gave me 8 more (Critical thinking, collaboration learning).}\)
• 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.
  \(32 + ? = 65\) becomes \(65 – 32 = ? 65 – 33 = 32 \text{ So } 32+ 33 = 65\)

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 → 1  
2) 65 → 4  
3) 88 → 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 – what = 16 → 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 - □ = 18  
2) 86 - □ = 60

**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 - □ = 40  
2) 92 - □ = 80  
3) 86 - □ = 60  
4) 100 - □ = 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 → 26  
2) 90 → 88  
3) 78 → 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?
  1) □ – 20 = 25
  2) □ – 15 = 30.

- Refer to the Learner’s Book page 83. Go through “Let us learn 3” with learners.
Review Exercise

Differentiated Lessons

Low Ability Learners
• Write these sentences for learners to solve in pairs:
  1) \( \square - 6 = 10 \)
  2) \( \square - 10 = 10 \)

High Ability Learners
• Working in pairs, have learners solve these:
  1) \( \square - 15 = 30 \)
  2) Mensah gave 10 pencils to his friend. He now has 20. How many pencils did he have initially?

Assessment for Learning:
Refer learners to Exercise 3 on page 85 of their Learner’s Book.

Suggested Home Work
Solve these:

  1) \( \square - 10 = 40 \)  2) \( \square - 10 = 75 \)
  1) \( \square - 20 = 75 \)  2) \( \square - 80 = 20 \)

For additional exercises on this module, refer to pages 44 - 46 of the Workbook.
**Module 4: Addition and subtraction word problems**

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

**Indicator:**
B2.1.21.1 Use conceptual understanding of addition and subtraction to add, 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.

**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.
  - 1) Mummy has 60 birds. Daddy brought her 12 more. Mummy now has 72 birds.
  - 2) 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 leaning)*

**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 Leaning**
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 leaning, 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 leaning, 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 “≠” 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 (≠) 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.

**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 → 10
2 6 → 4
3 1 → 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.

A 10 
B 10

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 (≠) 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 ≠ 52.

Refer to the Learner’s Book pages 91 and 92 Go through the exercises with learners using = and ≠ symbols.

**Review Exercise**

**Differentiated Lessons**

**Low Ability Learners**  
• Use the symbol = and ≠ to make the statements true.
  1) 50 – 45
  2) 65 – 56
  3) 73 – 73

**High Ability Learners**  
• Use the symbols = and ≠ to make the statements true.
  1) 25 + 5 __30
  2) 13 + 20 __20 + 31
  3) 60 __50 + 10

**Assessment for Learning**  
Refer learners to Exercise 1 on page 93 of the Learner’s Book for exercises.
Sub-Strand 2
Number: Operations (Addition, Subtraction, Multiplication, and Division)

Suggested Home Work
Use the symbols = or ≠ to make the statements true.

20 + 12 _______ 30
35 + 30 _______ 65
90 + 10 _______ 100
40 + 10 _______ 15 + 40

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 → 11
29 → 27
45 → 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 ≠.

(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.
1) 25 = 65 - 40 30 = 45 - 15
2) 25 ≠ 55 - 25 30 ≠ 40 - 20

(Critical thinking, collaborative learning)
Do the following activities with the class.
b) 52 – 35 and 43 – 35
28 – 16 = 14
37 – 23 = 14
14 = 14
So 28 – 16 = 37 – 23 = 14

52 – 35 = 17
43 – 32 = 11 17 ≠ 32
So 52 - 35 ≠ 43 - 32

Refer to Learners Book page 92. Go through the exercises with learners using = and ≠ symbols.

Review Exercise

Differentiated Lessons
Low Ability Learners
• Use the symbols = and ≠ to complete the number sentences.
1) 46 – 29 ....... 17
2) 18 – 10 ....... 12
27 – 17 ....... 10
4) 33 – 18 ....... 15

High Ability Learners
• Use the symbols = and ≠ to make the number sentence true.
1) 62 – 38 ....... 38 - 62
2) 74 – 52 ....... 52 – 38
3) 77 – 49 ....... 78 - 32
4) 87 – 43 ....... 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 ≠ to make the statements true.

1) 29 – 18 ....... 18
2) 47 – 29 ....... 16
3) 62 – 19 ....... 19 – 62
4) 74 – 25 ....... 68 – 19

For additional exercises on this module, refer to pages 50 - 52 of the Workbook.
Module 6: Relationship between addition and subtraction

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

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

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

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 → 9  2) 6 → 4  3) 0 → 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, Leaners change the addition sentence to subtraction sentence and solve it. E.g. 12 + ___ = 20
• This means 12 + what = 20. This could be changed to 20 – 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 – 8 = 12
• Repeat this activity with different questions (critical thinking, collaborative learning).
• Have learners practice in groups with these sentences. They exchange their work 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.

Review Exercise

Differentiated Lessons
Low Ability Learners
• Change these addition sentences into subtraction sentences and solve the problems. Learners work in pairs.
  1) 10 + ___ = 15  2) 22 + ___ = 30

High Ability Learners
• Working in pairs, learners change the addition sentences into subtraction sentences and solve them.
  1) ___ + 64 = 80  2) 36 + ___ = 56
  3) 72 + ___ = 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) ___ + 17 = 34  2) 56 + ___ = 70

Number of Lessons
2
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 → 51 (2) 45 → 44
(3) 69 → 68 (4)100 → 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 – □ = 15. Have learners explain what that subtraction sentence means. It means 20 – what = 15, learners change it into an addition sentence and solve: 20 – what = 15 means what + 15 = 20; 15 + □ = 20.
- Learners count on to get the answer. (*Critical thinking, collaborative learning, attention to precision*)
- Have learners work these in pairs.
  (1) 26 – □ = 18 (2) 30 – □ = 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 – □ = 10
(2) 17 – □ = 12

High Ability Learners
- Change these subtraction sentences into addition sentences and solve them.
  (1) 29 – □ = 13 (2) 68 – □ = 40
  (3) 59 – □ = 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 = □ (2) 68 – □ = 18
(3) 65 – □ = 30 (4) 33 – □ = 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.

**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**
1 Refer to page 98 of the Learner’s Book questions 2 but change 65 to 45 and 58 to 38.
2 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.

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 → 5  (2) 3 → 2  (3) 5 → 0  (4) 1 → 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.

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.

Lesson 1: Number bonds for 10

Starter
Play “Making 5s”. say a number and learners add another number to make 5.
1) 3 → 2  
2) 4 → 1  
3) 0 → 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)*

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

Review Exercise

Differentiated Lessons
Low Ability Learners
• Working in pairs, learners add another number to make 10.
  1) 6 and ?  
  2) 2 and ?  
  3) 7 and ?  
  4) 4 and ?

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

Assessment for Learning
Refer to Exercise 1 on pages 104 and 105 of the Learner’s Book for exercises.

Suggested Home Work
1) 2) 3) 4)

Learner’s Book page 102
Workbook page 60

Module 9: Addition and subtraction facts (fluency 2)
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 → 3 (2) 5 → 5 (3) 9 → 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.

Review Exercise
• 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

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.

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.

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 + [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 = [ ]. 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 → 10  (2) 2 → 8
(3) 6 → 4  (4) 1 → 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 $5 + 6 = \Box$.

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  $4 \to 8$
2  $3 \to 6$
3  $1 \to 2$
4  $5 \to 10$

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.

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)

Essentials for Learning
Learners can count backwards from 20 to 1.

New Words
Count back subtract.

Resources
Number line cards, 100 number chart.

• 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 + what = 15. What must be added to 7 to get 15? 7 + 8 = 15 so 15 – 7 = 8. (Critical thinking collaborative learning, attention to precision)
• Refer to the Learner’s Book page 112. Let us learn 2. 24 – 6 = → 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
Changing 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.

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 = 7 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 → 8  (2) 93 → 94  
(3) 81 → 82  (4) 66 → 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 (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
   +
   6

   2 + 1 → (10 + 4)
   14 + 4 so 28 + 6 = 34

- Give more exercises for learners to work in pairs.

(1) 38 + 9  (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  (2) 56 + 8

High Ability Learners
- Working in pairs, learners use the addition frame to solve the problems.
   1) 38 + 9  2) 67 + 7  3) 88 + 6

Assessment for Learning
Refer learners to Exercise 2 on 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 =  (2) 34 + 8 =  (3) 88 + 6 =

For additional exercises on this module, refer to pages 67 - 69 of the Workbook.
Module 13: Subtraction of whole numbers (within 100)

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

Indicator
B2.1.2.4.1: Use a conventional strategy to add and subtract within 100

Learning Expectation
Learners will be able to do subtraction of whole numbers with or without 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 → 29 (2) 66 → 65 (3) 14 → 13
(4) 23 → 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.

25 – 4 = ?

20 + 5 – 4
= 21

So 25 – 4 = 21

Using a place value frame:

<table>
<thead>
<tr>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>5</td>
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<tr>
<td>−</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

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

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 → 29  
2) 66 → 65  
3) 14 → 13  
4) 23 → 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.

<table>
<thead>
<tr>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>–</td>
<td>7</td>
</tr>
<tr>
<td>3</td>
<td>13</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
</tr>
</tbody>
</table>

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 Learner’s 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.

### 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 → 8  2) 4 → 6  3) 7 → 3  4) 1 → 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.

\[(40 + 30) + (5 + 3)\]
\[70 + 8 = 78\]

**Let us Learn 1**
- Put Learners into groups of five. Write these numerals on the board for learners to decompose:
  1) 66  2) 87  3) 66
  
\[
\begin{align*}
60 + 6 & \quad 20 + 60 + 7 & \quad 40 + 20 + 6 \\
60 + 6 & \quad 20 + 60 + 7 & \quad 40 + 20 + 6
\end{align*}
\]

Learners use the decomposition strategy to add. 39 + 35

\[
\begin{align*}
30 + 9 & \quad 30 + 5 \\
30 + 9 & \quad 30 + 5
\end{align*}
\]

**Essentials for Learning**
Learners can add 2 numbers that sum up to 20.

**New words**
decompose, friendly, jumps, break.

**Resources**
Straws, bottle caps.

\[
\begin{align*}
30 + 30 \quad + 9 + 5 & = 14 \\
60 + 10 + 4 & = 74 \\
60 + 10 + 4 & = 74
\end{align*}
\]

\[
\begin{align*}
\text{• Repeat this exercise with several other numbers. Have learners work in pairs.} \\
\text{(Critical thinking, collaborative learning)}
\end{align*}
\]

\[
\begin{align*}
\text{• Refer learners to the Learner’s Book page 124. Go through the “Let us learn 1” exercise with learners 36 + 25 and 43 + 39.}
\end{align*}
\]

**Differentiated Lessons**

**Low Ability Learners**
- Use the decomposition strategy to add. Work in pairs
  1) 28 + 31 = ?  
  2) 42 + 37 = ?

**High Ability Learners**
- Working in pairs use the decomposition strategy to solve these addition sentences
  1) 64 + 44 = ?  
  2) 33 + 55 = ?

**Assessment for Learning**
Refer learners to Exercise 1 on page 126 of the Learner’s Book for exercises.

**Suggested Home Work**
Use the decomposition strategy to solve these addition sentences.

\[
\begin{align*}
1) 52 + 37 & \quad 2) 26 + 44 \\
3) 13 + 66 & \quad 4) 54 + 34
\end{align*}
\]
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 + 25 = 68. (Critical thinking, collaborative learning, attention to precision)

• Give addition sentences to each group. They decompose one of the numbers and use friendly jumps to add.
  1) 46 + 33
  2) 62 + 37
  3) 53 + 27

• Learners move round to compare how other learners decomposed their numbers 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 = __. 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.
  1) 26 + 31
  2) 42 + 37

High Ability Learners
• Solve these. Use the decomposition strategy and friendly jumps.
  1) 48 + 37
  2) 66 + 33
  3) 28 + 76

Suggested Home Work
Add these numbers, using friendly jumps and decomposition strategies.
  1) 42 + 17
  2) 56 + 32
  3) 26 + 44
  4) 65 + 36

For additional exercises on this module, refer to pages 73 - 75 of the Workbook.
Module 15: Personal strategies for addition (2)

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

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

**Learning Expectation**
Learners will be able to do addition using the “moving part” strategies.

**Essentials for Learning**
Learners can do addition and subtraction using the decomposition strategy.

**New Words**
Little bit, take away

**Resources**
Bottles caps, straws

**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 → 4  2) 7 → 3  3) 0 → 10  4) 10 → 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.

**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 → 8  2) 27 → 29  3) 68 → 70  4) 88 → 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-digit numbers using the compensation strategy.

New words
Count on, increment, decompose, minus, split.

Resources
Number line cards, straws, addition sentence cards.

Lesson 1: Subtraction “using counting on”

Starter
Play “Making doubles”. Call out a number between 1 and 5 and learners double it.
1) 3 → 6  2) 4 → 8  3) 1 → 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.

43 – 19 = ?

Learners change the subtraction sentence to 19 + ? = 43. Learners use the counting on strategy to solve it.

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 → 4  2) 5 → 10  3) 10 → 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 \(43 - 19 = 19\)

**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 → 12 2) 25 → 24 3) 16 → 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.
- \(43 - 10 = 33\)
- \(33 - 3 = (Decompose 9 as 3 and 6)\)
- \(33 - 3 = 30, 30 - 6 = 24\)
- 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.

Lesson 1: Subtraction (using compensation)

Starter
Play “1 less than”. Say a number and learners subtract 1 from it, e.g. 1) 16 → 15 2) 10 → 9 3) 7 → 6 4) 50 → 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.

Differentiated Lessons
Low Ability Learners
• Have learners work in pairs to solve these.
  1) 35 – 19 = ?
  2) 32 – 18 = ?
Sub-Strand 2  Number: Operations (Addition, Subtraction, Multiplication, and Division)

High Ability Learners
• Have learners work in pairs and solve these. (They should use compensation by adding and subtracting.)
  1) 85 – 58 = ?
  2) 76 – 29 = ?

Assessment for Learning
Suggested Home Work
Subtract, using the compensation strategy
  1) 47 – 21 = ?
  2) 76 – 58 = ?
  3) 62 – 28 = ?
  4) 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:
  1) 7 → 5
  2) 2 → 0
  3) 15 → 13
  4) 20 → 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.
  1) Decompose with learners 33 as (10 + 10 + 10 + 3)
  2) Subtract 10 three times from 64 (64 – 10 = 54 – 10 = 44 – 10 = 34)
  3) Now subtract 3 from 34, so 64 – 33 = 31
• The number line could also be used to do the subtraction.

High Ability Learners
• 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.
  1) 37 – 25 = ?
  2) 63 – 35 = ?
• Refer learners to Let us Learn: 2 on page 135 of the Learner’s Book.

Review Exercise

Differentiated Lessons
Low Ability Learners
• Use friendly jumps to solve these. Give learners subtraction sentence cards.
  1) 45 – 18 = ?
  2) 56 – 27 = ?

High Ability Learners
Work in pairs
  1) 73 – 21 = ?
  2) 56 – 37 = ?
  3) 84 – 43 = ?

Assessment for Learning
Refer learners to Exercise 2 on page 138 of the Learner’s Book.

Suggested Home Work
Use friendly jumps to solve these subtraction sentences.
  1) 32 – 25
  2) 66 – 37
  3) 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

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.


(Long division, 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 cola 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 + 28 = 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
1) Selasi has GH₵28 in his pocket. His father gave him GH₵15.00 more. How much has Selasi now?
2) Teacher Nkrumah has 48 red bottle caps. She also has 37 white bottle caps. How many caps has she altogether?

Lesson 2: Addition word problems (using 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.
  
  24 + 45 = 69
  
  20 + 40 + 4 + 5
  
  60 + 9

• Give addition sentence cards to learners in pairs. Have learners work on them.
  
  1) 33 + 46 = ?
  
  2) 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)

High Ability Learners
• A shopkeeper has 18 pencils in one box and 42 in another box. How many pencils has he altogether?

Assessment for Learning
Refer learners to page 142 of their textbooks for exercises.

Suggested Home Work
Use the decomposition strategy to solve these.
1) Agya Ansong brought 58 cocoa pods home. His wife Frempomah also brought 37 pods more. How many pods of cocoa are in the house now?
2) Amina prepared 42 TZ balls to sell at the school canteen. Her daughter Fatima added 35 more. How many TZ balls has Amina to sell now?

Review Exercise
Use the compensation strategy.

Differentiated Lessons
Low Ability Learners
• Learners work in pairs to solve this.
  1) I have 25 eggs. I used 8 for breakfast. How many eggs do I have now?

High Ability Learners
• There are 75 Mathematics and English textbooks on a shelf. 47 are English textbooks. How many are Mathematics textbooks?

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.
1) I have a number of bulbs in my box. 26 are broken. I now have 32 good ones. How many are good?
2) 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 → 6 2) 12 → 10 3) 2 → 0

Find Out
Refer to book page 143.
Deduce from learners “How much less the amount needed. They should 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 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.
1) There are 50 pens in a box, 22 are red. How many are blue?
2) Alaba went to buy 72 fish at the sea-shore. She sold 67. How many fish are left?

Suggested Home Work
Solve these.
1) 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 → 6  2) 12 → 10  3) 5 → 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 sentences 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? □ – 22 = 16.

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 → 8  2) 11 → 10  3) 20 → 19  4) 50 → 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-nutss 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.
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?

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.

For additional exercises on this module, refer to pages 90 - 94 of the Workbook.
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, port.

Resources:
Sheets of paper, colour pencils, oranges, diagrams showing halves of objects etc.

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 watermelon? 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 the 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.

### 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.

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;

<table>
<thead>
<tr>
<th>Number of items</th>
<th>8</th>
<th>14</th>
<th>24</th>
<th>32</th>
</tr>
</thead>
<tbody>
<tr>
<td>Halves</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.

Lesson 4: Identifying quarter of amount (2)

Put learners into groups of five.
Give learners a table of values:

<table>
<thead>
<tr>
<th>Number of items</th>
<th>12</th>
<th>24</th>
<th>32</th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Halves</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Task learners to count a number of counters to represent the number of 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.

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 1646 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

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.
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.

**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.
  1) 10, 12, 14, 16.........................
  2) 42, 47, 52............................... 
  3) 63, 73, 83............................... 
  4) 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.

  1) 42, 47, 52.........................
  2) 16, 18, 20.........................
  3) 41, 51 61.........................

**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.
  1) 17, 15, 13.........................
  2) 68, 63, 58............................... 
  3) 72, 62, 52............................... 
  4) 64, 62, 60............................... 
- Learners swap over the questions and discuss their answers with all the 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 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.
  1) 17, 15, 13.........................
  2) 68, 63, 58............................... 
  3) 72, 62, 52............................... 
  4) 64, 62, 60............................... 
- Learners swap over the questions and discuss their answers with all the 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.
1) 10, 20, 30, 60, 40
2) 5, 10, 15, 16, 20
3) 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)
Sub-Strand 1 Patterns and relationship

- Write these number patterns on the board for learners to identify the errors.
  1) 33, 43, 53, 73, 63,
  2) 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.
  1) 23, 21, 20, 19, 17
  2) 42, 52, 32, 22,12

**High Ability Learners**
Learners should work in pairs and identify the errors.
  1) 84, 81, 79, 77,
  2) 33, 32, 28, 23,
  3) 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.

<table>
<thead>
<tr>
<th>8</th>
<th>18</th>
<th>28</th>
<th>49</th>
<th>38</th>
<th>48</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>33</td>
<td>43</td>
<td>53</td>
<td>60</td>
<td>63</td>
</tr>
</tbody>
</table>
- 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.
  1) 15, 25, 26, 35
  2) 4, 14, 24, 34, 45, 44
  3) 20, 30, 40, 55, 50

**High Ability Learners**
- Identify the errors in these patterns.
  1) 48, 58, 68, 75, 78.
  2) 35, 44, 55, 65, 75, 80, 85.
  3) 27, 37, 48, 47, 57.
  4) 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
  1) 6, 16, 26, 36, 46, 56, 53
  2) 14, 24, 29, 34, 44
  3) 29, 30, 39, 49, 59
  4) 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.

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) 1, 3, 5, 1, 3, 5 1, 3, 5………………
  2) 3, 5, 7, 9…………...............……...
  3) 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.
  1) 4, 5, 6, 4, 5, 6 ___ ___
  2) 19, 17, 15, 19 ___ ___

High Ability Learners
- Work in pairs, learners continue these patterns with the next 2 terms
  1) 72, 73, 74…………………..
  2) 52, 62, 72…………………..
  3) 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.
  1) 10, 20, 30, ___ ___
  2) 4, 6, 8, ___ ___
  3) 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.

```plaintext
1) 40 35 30 ------- -------
2) 38 33 28 ------- -------
3) 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.
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) 1, 3, 5, 7……………..
  2) 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.
  1) 55, 57, 59, __ __
  2) 38, 37, 35 __ __

Assessment for Learning
Refer learners to Exercise 1 on page 189 of the Learner’s Book for exercises. Learners books for exercises.

Suggested Home Work
Find rules for these patterns and continue with the next 3 terms.
  1) 24, 26, 28, __ __ __
  2) 12, 17, 22, __ __ __
  3) 50, 60, 70, __ __ __
  4) 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. I give these number pattern cards for learners to continue with the next 2 terms. They find rules for the patterns and justify their
Sub-Strand 1 Patterns and relationship

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.
  1) 60, 50, 40…………..
  2) 30, 25, 20…………..

High Ability Learners
- Working in pairs, learners continue with the next 3 terms and find rules for the patterns.
  1) 65, 60, 55…………..
  2) 29, 27, 25…………..

Assessment for Learning
Refer learners to Exercise 2 on page 189 of their Learner’s 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
  1) __________________
  2) __________________

- 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.
Strand: 3
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.

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 notebooks.

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.

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.

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 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 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 I 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
1. Draw and colour a cube and a cuboid.
2. Draw and colour two objects that have the shape of a sphere.
3. Write any two objects that have a rectangular shape.
4. Use these criteria to describe the following 3D objects

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Cone</th>
<th>Cylinder</th>
<th>Sphere</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corners</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faces</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roll/not roll</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flat face/curved</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Cuboid</th>
<th>Cube</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corners</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faces</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roll/not roll</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flat face/curved</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Write three examples of real objects for each of the 3Ds in the table

<table>
<thead>
<tr>
<th>Objects</th>
<th>Sphere</th>
<th>Cylinder</th>
<th>Cuboid</th>
<th>Cube</th>
</tr>
</thead>
<tbody>
<tr>
<td>E.g. ball</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For additional exercises on this module, refer to pages 120 - 121 of the Workbook
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.

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. \textit{(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. \textit{(Collaborative learning)}
• Task learners to match the shapes by their colours.
Sub-Strand 2 Number: Operations (Addition, Subtraction, Multiplication and Division)

- 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.

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.

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.

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.
• 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.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Hexagon</th>
<th>Square</th>
<th>Rectangle</th>
<th>Triangle</th>
<th>Circle</th>
<th>Rhombus</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Number of Corners</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Number of sides</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Number of vertices</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.

**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.

**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.

**Number of Lessons** 2

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

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.

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.

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)
Sub-Strand 2 Position/Transformation

• 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.

### 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.

**Review Exercise**

- Hold a whole class discussion on how many counts each group got. *(Collaborative learning)*

**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)*
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.

<table>
<thead>
<tr>
<th>Number of straws</th>
<th>Number of pencils</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.

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”.

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.

<table>
<thead>
<tr>
<th>Heavier</th>
<th>Lighter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For additional exercises on this module, refer to pages 135 - 136 of the Workbook.
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.
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.

<table>
<thead>
<tr>
<th>Holds more</th>
<th>Holds less</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Write the names of two items under the following headings:

<table>
<thead>
<tr>
<th>Holds less</th>
<th>Holds more</th>
</tr>
</thead>
<tbody>
<tr>
<td>E.g. mug</td>
<td>Cooking pan</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.

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)

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.

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.

Number of Lessons 2
Learner’s Book page 232
Workbook page 142
Module 5: Standard unit for measuring length
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.

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.

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 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 again.
• Put learners into groups and present each group with a calendar.
• Task learners to count the number of days

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.
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.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Time it takes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Time it takes to be in school</td>
<td>It takes about ……. to stay in school</td>
</tr>
<tr>
<td>2. Time it takes to wash</td>
<td>It takes about………. to wash</td>
</tr>
<tr>
<td>3. Time it takes to brush teeth</td>
<td>It takes about………. to brush teeth</td>
</tr>
<tr>
<td>4. Time it takes to bath</td>
<td>It takes about………… to bath</td>
</tr>
<tr>
<td>5. Time it takes to sweep</td>
<td>It takes about………… to sweep</td>
</tr>
</tbody>
</table>

- 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

<table>
<thead>
<tr>
<th>Activity</th>
<th>Time it takes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Time it takes to eat</td>
<td></td>
</tr>
<tr>
<td>2. Time it takes to walk from home to school</td>
<td></td>
</tr>
<tr>
<td>3. Time it takes to do Homework</td>
<td></td>
</tr>
<tr>
<td>4. Time it takes to sing a song</td>
<td></td>
</tr>
<tr>
<td>5. Time it takes to walk from the classroom to the canteen</td>
<td></td>
</tr>
</tbody>
</table>

For additional exercises on this module, refer to pages 146 - 147 of the Workbook.
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.

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.

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.

<table>
<thead>
<tr>
<th>Time Relationship</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 seconds</td>
<td>make 1 minute</td>
</tr>
<tr>
<td>60 minutes</td>
<td>make 1 hour</td>
</tr>
<tr>
<td>24 hours</td>
<td>make 1 day</td>
</tr>
</tbody>
</table>

- Play “It’s a match”. Give learners cards showing various units of time.
- Show a unit e.g. 60 seconds. Learners hold up a card showing 1 minute on it.

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.

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.
Sub-Strand 3 Measurement – Length, Mass, Capacity and Time

7 days make 1 week
4 weeks make 1 month
12 months make 1 year

• Play “It’s 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.

<table>
<thead>
<tr>
<th>3:15</th>
<th>8:00</th>
</tr>
</thead>
<tbody>
<tr>
<td>6:30</td>
<td>7:45</td>
</tr>
</tbody>
</table>

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.
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 “Prentoa Baako”.

Find Out
Refer learners to page 252 of the Learners’ Book. Learners identify the different shapes there, count them and write the number for each category.

Let us Learn
• Write the followingsubjects 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. 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)
  • Refer to book page 253 and 254 of the Learner’s Book. Ask learners to indicate the drinks they like best. Guide them to put a tally in the columns as they answer the questions.

<table>
<thead>
<tr>
<th>Colour</th>
<th>Tally</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blue</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yellow</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

120
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.

<table>
<thead>
<tr>
<th>Type of people</th>
<th>Tally</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.

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.

<table>
<thead>
<tr>
<th>Fruits</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>mango</td>
<td></td>
</tr>
<tr>
<td>Orange</td>
<td></td>
</tr>
<tr>
<td>Paw paw</td>
<td></td>
</tr>
<tr>
<td>Apple</td>
<td></td>
</tr>
</tbody>
</table>

• Learners working on their own, ask questions to determine which is the most popular fruit among learners. The 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.

<table>
<thead>
<tr>
<th>Type of People</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female teachers</td>
<td></td>
</tr>
<tr>
<td>Male Teachers</td>
<td></td>
</tr>
<tr>
<td>Girls in class</td>
<td></td>
</tr>
<tr>
<td>Boys in class</td>
<td></td>
</tr>
</tbody>
</table>

1) Which group has more people? _____
2) Which group has fewer people? _____
3) 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)

Pencils          Erasers          Pens
8
7
6
5
4
3
2
1
0

• 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.

Review Exercise
Give learners bottle caps indifferent 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
1. 11 Eleven
2. 13 Thirteen
3. 16 Sixteen
4. 19 Nineteen

Exercise 2 page 15
1. Eighty five
2. Forty nine
3. Sixty nine
4. Ninety six
5. One hundred

Exercise 3
746 – Seven hundred and forty six
164 – One hundred and sixty four
823 – Eight hundred and twenty three
291 – Two hundred and ninety one
912 – Nine hundred and twelve

Module 2: Counting sequence
Exercise 1 page 18
1. 6 8 12
2. 2 6 8 10
3. 14 16 20 22
4. 50 52 54 56 58 60
5. 30 32 34 36 38 40
6. 47 49 51 53 55 57

Exercise 2 page 19
1. 16 14 12 10 8
2. 10 8 6 4 2 0
3. 60 56 52 48
4. 42 40 38 34
5. 38 36 34 32 30 28
6. 98 96 94 92 90 88
7. 52 50 48 46 44 42

Exercise 3 page 20
1. 105 115 125 130 140 145
155 160 170

Exercise 4 page 21
1. 495 490 485 480 475
2. 340 335 330 320
3. 405 400 395 380

Module 3: Counting to find “how many”.
Exercise 1 page 26
1. a. 14
   b. 28
2. a. 18
   b. 36
3. a. 26
   b. 52
4. a. 20
   b. 40

Exercise 2 page 27
1. 150
2. 90

Exercise 3 page 28
1. 80
2. 150

Module 4: Representing quantities with numerals.
Exercise 1 page 31
1. 24
2. 132
3. 20
4. 40
5. 140
6. 115

Exercise 2 page 32
1. 217
2. 533
3. 660
4. 999
5. 1000
Module 5: Estimating quantities.

Exercise 1  page 35
1. estimate 20  actual 22
2. estimate 40  actual 37
3. estimate 10  actual 11
4. 80

Check on learners answers for the estimates.

Module 6: Describing the position of numbers.

Exercise 1  page 38
1. a. 543  b. 158 and 917
c. 293 and 46  d. 666
2. a. left of  b. above
c. below  d. left of

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

Exercise 1  page 41
To be done by learners.

Exercise 2  page 42
1. a. 6 arm spans or 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. eight  b. six hundred  b. six

Exercise 2  page 48

<table>
<thead>
<tr>
<th>hundreds</th>
<th>tens</th>
<th>ones</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2.</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>3.</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>4.</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>5.</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>6.</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>7.</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>8.</td>
<td>9</td>
<td>9</td>
</tr>
</tbody>
</table>

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
ANSWERS

Exercise 2  
1. 8 groups  5 pebbles  3 left over  
   43 pebbles  
2. 9 groups  3 pebbles  none  27 pebbles

Module 13: Comparing whole numbers 
using the symbol >,< or =

Exercise 1  
1. >  
2. >  
3. =  
4. Any number less than 72 
5. Any number greater than 24 
6. Check on learners answer 
7. Any number greater than 45 
8. Any number greater than 65 

Exercise 2  
1. 89 ; 78 
2. 20 ; 50 
3. 42 ; 63 
4. 75 ; 39 
5. 66 < 84 
6. 74 > 47 
7. 39 < 86 
8. 56 < 89

Module 14: Ordering whole numbers

Exercise 1  
1. a.18 b.19 c. 21 d.15 e.18 f.15 
2. a. 13 b. 14 c. 12 d.10 e.11 f.12 
   g. 29 h.26 i. 35 

Exercise 2  
1. 22 30 63 72 75 
2. 25 28 65 83 90 
3. 98 87 70 30 25 
4. 81 76 72 65 36 
5. 29 46 50 63 71 79 
6. 97 90 83 65 28 25

Module 15: Finding missing numbers

Exercise 1  
1. 28 30 34 38 
2. 50 65 70 80 
3. 30 60 80 90 
4. 58 59 62 63 
5. 30 40 50 60 70 80 
6. 40 50 60 70 80 90 
7. 15 25 35 55 65 75 
8. 33 43 63 73 83 93

Exercise 2  
1. 2 3 4 7 8 
11 13 15 16 18 19 
20 21 23 25 26 28 
30 33 34 37 39 40 
41 42 44 45 46 47 
49 52 53 55 56 58 
61 63 64 67 69 70 
71 72 76 77 79 80 
82 84 86 88 89 91 
94 95 97 98 100 

Exercise 2  
1. 22 23 24 25 
31 33 34 35 
15 16 17 18 
25 26 27 29 

Module 16: Word Problems Involving comparism.

Exercise 1  
1. a. Fatima 
   b. Amavi 
2. a. B 
   b. A 
3. a. Antwi 
   b. Kwame 
4. a. Dela 
   b. Dede

Exercise 2  
1. more 42 ; 50 
2. 86 is bigger 37 is less

Reflection Exercise 1  
1. Match 
   9 → nine 
   60 → sixty 
   15 → fifteen 
   30 → thirty 
2. 16 18 
   3. 58 56 
4. 30 35 
   5. 35 40 
6. 90 70 
   7. 60 90 
8. 313 
   9. 433 
10. a. Tens 
    b. Ninety 
11. Hundreds 
    b. Four hundred 
12. Ones 
    b. Five

Reflection Exercise 2  
1. 252 2. 84 
   252 = 200 + 50 + 2 
   84 = 80 + 4 
3. 843 = 800 + 40 + 3 
4. = 5. > 
   6. > 
7. < 8. < 
   9. =

Module 14: Ordering whole numbers

Exercise 1  
1. a.18 b.19 c. 21 d.15 e.18 f.15 
2. a. 13 b. 14 c. 12 d.10 e.11 f.12 
   g. 29 h.26 i. 35 

Exercise 2  
1. 22 30 63 72 75 
2. 25 28 65 83 90 
3. 98 87 70 30 25 
4. 81 76 72 65 36 
5. 29 46 50 63 71 79 
6. 97 90 83 65 28 25

Module 15: Finding missing numbers

Exercise 1  
1. 28 30 34 38 
2. 50 65 70 80 
3. 30 60 80 90 
4. 58 59 62 63

Reflection Exercise 1  
1. Match 
   9 → nine 
   60 → sixty 
   15 → fifteen 
   30 → thirty 
2. 16 18 
   3. 58 56 
4. 30 35 
   5. 35 40 
6. 90 70 
   7. 60 90 
8. 313 
   9. 433 
10. a. Tens 
    b. Ninety 
11. Hundreds 
    b. Four hundred 
12. Ones 
    b. Five

Reflection Exercise 2  
1. 252 2. 84 
   252 = 200 + 50 + 2 
   84 = 80 + 4 
3. 843 = 800 + 40 + 3 
4. = 5. > 
   6. > 
7. < 8. < 
   9. =
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 = 34; 34 apples are red
7. 45 + 24 = 69
8. 38 + 44 = 82; 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. ≠

**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
Module 7: Addition and subtraction facts  
(fluency 1)
Exercise 1  page 98
1. 30 31 32
2. 55 56 57 58
3. 1 2 3
4. 35 42 43 44 45

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 |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2 + 2 = 4</td>
</tr>
<tr>
<td>3</td>
<td>3 + 3 = 6</td>
</tr>
<tr>
<td>4</td>
<td>4 + 4 = 8</td>
</tr>
<tr>
<td>8</td>
<td>8 + 8 = 16</td>
</tr>
<tr>
<td>6</td>
<td>6 + 6 = 12</td>
</tr>
<tr>
<td>9</td>
<td>9 + 9 = 18</td>
</tr>
</tbody>
</table>

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 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 = 10 + 4 = 14
5. 14 4 + 4 + 2 = 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
   4 + 5 = 9
   7 + 5 = 12
9. 7 10. 11
   7 + 12 = 19
   11 + 7 = 18
### Module 12: Addition of whole numbers (sum up to 100)

**Exercise 1**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>69</td>
<td>2</td>
<td>33</td>
</tr>
<tr>
<td>3</td>
<td>43</td>
<td>4</td>
<td>94</td>
</tr>
<tr>
<td>5</td>
<td>32 + 5 = 37</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Exercise 2**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>43 + 6 = 49</td>
<td>2</td>
<td>62 + 4 = 66</td>
</tr>
<tr>
<td>3</td>
<td>8 + 35 = 43</td>
<td>4</td>
<td>36 + 8 = 44</td>
</tr>
<tr>
<td>5</td>
<td>46 + 5 = 51</td>
<td>6</td>
<td>35 + 8 = 43</td>
</tr>
</tbody>
</table>

### Module 13: Subtraction of whole numbers (within 100)

**Exercise 1**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>42</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>19</td>
<td>5</td>
<td>35</td>
</tr>
</tbody>
</table>

**Exercise 2**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>15 − 7 = 8</td>
<td>2</td>
<td>37 − 7 = 30</td>
</tr>
<tr>
<td>3</td>
<td>65 − 14 = 51</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Module 14: Personal strategies for addition (1)

**Exercise 1**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>40 + 30 + 2 + 6 = 78</td>
<td>2</td>
<td>60 + 20 + 5 + 4 = 89</td>
</tr>
<tr>
<td>3</td>
<td>20 + 40 + 4 + 9 = 73</td>
<td>4</td>
<td>60 + 20 + 4 + 6 = 90</td>
</tr>
<tr>
<td>5</td>
<td>50 + 20 + 1 + 8 = 79</td>
<td>6</td>
<td>60 + 30 + 5 + 1 = 96</td>
</tr>
</tbody>
</table>

**Exercise 2**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>52</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>79</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>82</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>84</td>
<td></td>
</tr>
</tbody>
</table>

### Module 15: Personal strategies for addition (2)

**Exercise 1**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>84</td>
<td>2</td>
<td>41</td>
</tr>
<tr>
<td>3</td>
<td>60</td>
<td>4</td>
<td>32</td>
</tr>
<tr>
<td>5</td>
<td>73</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Exercise 2**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>41</td>
<td>2</td>
<td>74</td>
</tr>
<tr>
<td>3</td>
<td>91</td>
<td>4</td>
<td>87</td>
</tr>
<tr>
<td>5</td>
<td>61</td>
<td>6</td>
<td>83</td>
</tr>
<tr>
<td>7</td>
<td>81</td>
<td>8</td>
<td>92</td>
</tr>
</tbody>
</table>

### Module 16: Personal strategies for subtraction (1)

**Exercise 1**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>39 − 13 = 26</td>
<td>2</td>
<td>43 − 19 = 24</td>
</tr>
<tr>
<td>3</td>
<td>54 − 26 = 28</td>
<td>4</td>
<td>43 − 13 = 30</td>
</tr>
</tbody>
</table>

**Exercise 2**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>45 − 15 = 30</td>
<td>2</td>
<td>54 − 18 = 36</td>
</tr>
<tr>
<td>3</td>
<td>94 − 76 = 18</td>
<td>4</td>
<td>29 − 13 = 16</td>
</tr>
<tr>
<td>5</td>
<td>34 − 12 = 22</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Exercise 3**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>88 − 21 = 67</td>
<td>2</td>
<td>48 − 17 = 31</td>
</tr>
<tr>
<td>3</td>
<td>84 − 46 = 38</td>
<td>4</td>
<td>97 − 35 = 62</td>
</tr>
</tbody>
</table>

### Module 17: Personal strategies for subtraction (2)

**Exercise 1**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>49 − 27 = 22</td>
<td>2</td>
<td>57 − 18 = 39</td>
</tr>
<tr>
<td>3</td>
<td>84 − 39 = 45</td>
<td>4</td>
<td>75 − 27 = 48</td>
</tr>
<tr>
<td>5</td>
<td>72 − 55 = 17</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Exercise 2**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>48 − 21 = 27</td>
<td>2</td>
<td>82 − 43 = 39</td>
</tr>
<tr>
<td>3</td>
<td>92 − 37 = 55</td>
<td>4</td>
<td>73 − 55 = 18</td>
</tr>
<tr>
<td>5</td>
<td>68 − 24 = 44</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Exercise 3**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>42 − 26 = 16</td>
<td>2</td>
<td>65 − 27 = 38</td>
</tr>
<tr>
<td>3</td>
<td>96 − 74 = 22</td>
<td>4</td>
<td>83 − 44 = 39</td>
</tr>
<tr>
<td>5</td>
<td>58 − 23 = 35</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

**Exercise 1**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>48 + 51 = 99</td>
<td>2</td>
<td>66 + 33 = 99</td>
</tr>
<tr>
<td>3</td>
<td>32 + 57 = 89</td>
<td>4</td>
<td>80 + 15 = 95</td>
</tr>
<tr>
<td>5</td>
<td>62 + 8 = 70</td>
<td>6</td>
<td>52 + 26 = 78</td>
</tr>
</tbody>
</table>

**Exercise 2**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>42 + 19 = 61 yams</td>
<td>2</td>
<td>47 − 38 = 9 books</td>
</tr>
<tr>
<td>3</td>
<td>27 + 14 = 41 oranges</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Module 19: Word problems involving subtraction (within 100)

**Exercise 1**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>51 − 13 = 38 good snails</td>
<td>2</td>
<td>35 − 28 = 7 pens</td>
</tr>
<tr>
<td>3</td>
<td>56 − 39 = 17 toffees</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Exercise 2 page 147
1. \(84-65=19\) bottle caps
2. \(73-58=15\) mangoes
3. \(70-55=10\)

Reflection Exercise 3 page 148
1. 20
2. 55, 18
3. \(10 + 35 + 15 = 55\) in any order.
4. \(10 + 15 + 35 = 55\) in any order.
5. 40
6. 61
7. 57
8. 50
9. 30
10. 47
11. 98-15 = 83
12. - 14. check on learners answers

Reflection Exercise 4 page 149
1. ≠
2. =
3. ≠
4. ≠
5. 6
6. 25
7. 19
8. 55
9. 18
10. 10
11. 27
12. 27
13. 43
14. 77
15. 75
16. 37
17. 64
18. 0

Strand 1: Number
Sub Strand 3: Fractions
Module 1: Making halves
Exercise 1 page 152
1. a
2. b
3. b
4. a

Exercise 2 pages 153 and 154
1. 8
2. 10
3. 6
4. 4
5. 12
6. 22

Module 2: Making quarters
Exercise 1 page 157
a, d, f, g

Exercise 2 page 158
1. - 4. check on learners answers
5. 8 quarters
6. 16 quarters

7. 20 quarters
8. 12 quarters

Module 3: Halves and quarters of an amount.
Exercise 1 page 160
1. One-half.
2. One-half
3. One-half

Exercise 2 page 161
1. One-quarter.
2. One-half.
3. One-quarter.
4. three-quarters.
5. One-half
6. One-quarter
7. three-quarters
8. One-half

Exercise 3 page 162
check on learners answers

Reflection exercise 5 page 163
1. ✓ 2. X 3. ✓
4 - 6 Check on learners’ answers.
7. one quarter
8. one-half
9. three quarters
10. one quarter
11. three quarters
12. one half
13. one quarter

Strand 1: Number
Sub Strand 4: Money
Module 1: Recognising Ghanaian coins and notes by name
Exercise 1 page 166
1. Ȼ2
2. 50 pesewas
3. Ȼ1
4. 20 pesewas
5. 60 pesewas
6. 80 pesewas

Exercise 2 page 167
1. GHȻ 5
2. GHȻ 16
3. GHȻ 8
4. GHȻ 8

Exercise 3 page 166
1→ C 2→ A 3→ B 4→ A 5→ C

Module 2: Relationship among the cedi notes
Exercise 1 page 171
1. 20
2. 4
3. 5
4. 5
Reflection exercise 6  
2. 5 cedis, 10 cedis, 20 cedis, 50 cedis.
3. 20 pesewas, 10 pesewas, 5 pesewas, 1 pesewa.
4. 5 cedis, 2 cedis, 1 cedi.
5. 5
6. Learners to do these.

STRAND 2: Algebra
Sub-strand 1: Patterns and Relationship
Module 1: Increasing and decreasing number patterns
Exercise 1  
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  
1. 84 79 74 69 64 53 43 38  
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  
The rule: Subtract 10
5. 99 94 89 84 79 74 69  
The rule: Subtract 5
6. 50 45 40 35 30 25 20  
The rule: Subtract 5

Module 2: Identifying errors/omissions in patterns
Exercise 1  
1. Error 56
2. Error 64
3. Error 442
4. Error 45
5. Error 120

Exercise 2  
1. 355, 350
2. 147, 142
3. 769, 764
4. 535, 530

Exercise 3  
1. Error 15
2. Error 56
3. Error 442
4. Error 120

Module 3: Finding missing terms in pattern
Exercise 1  
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, 66, 54, 48, 42, 36, 30
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  
1. 36, 38, 40 42, 44, 46, 48, 50  
Add 2
2. 45, 50, 55, 60, 65, 70  
Add 5
Subtract 10
4. 84, 84, 84, 84, 84, 84, 84  
Add 2

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

Exercise 3  
1. pen, pencil, book, pencil.
2. girl, girl, boy, girl.
3. spoon, fork, knife.
4. O, □, △
5. table, bottle, chair
6. check on learners’ answers.
7. check on learners’ answers.
Reflection exercise 7  page 191
1. rule: Add 2
2. rule: Add 5
3. rule: Add 10
4. 3  8  13  18  23  28
5. 27  29  31  33  35  37
6. 30  40  50  60  70  80
7. Check on learners answers.

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.

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 2: 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 227
1 → 4th 2 → 3rd 3 → 5th 4 → 2nd 5 → 1st

Module 3: Measuring capacity.
Exercise 1 page 226
1. less than
2. less than
3. more than

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 minutes: 30 hours: 1
2. seconds: 55 minutes: 15 hours: 6
3. seconds: 15 minutes: 5 hours: 2

Exercise 4 page 247
1. 60
2. 24
3. 7
4. 12

Exercise 5 page 247
1. 480
2. 180
3. 48
4. 1440
5. 24

Reflection exercise 10 page 248 & 249
1. 7 units 3. a
2. 5 4. b
5. Heavy - c heavier - a heaviest - b
6. heavier
7. lighter
8. Colour 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
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.

<table>
<thead>
<tr>
<th>Fruits</th>
<th>Tally</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>(apple)</td>
<td>//////</td>
<td>7</td>
</tr>
<tr>
<td>orange</td>
<td>//////</td>
<td>5</td>
</tr>
<tr>
<td>(banana)</td>
<td>/////</td>
<td>10</td>
</tr>
<tr>
<td>(pear)</td>
<td>/////</td>
<td>12</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Ages (in years)</th>
<th>Tally</th>
<th>Number of learners</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>////////// /</td>
<td>15</td>
</tr>
<tr>
<td>7</td>
<td>//////////// /</td>
<td>21</td>
</tr>
<tr>
<td>8</td>
<td>/////////////</td>
<td>14</td>
</tr>
</tbody>
</table>

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

Module 3: Counting to find “how many”

Trial 1 page 8
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. 30
4. 120

Module 4: Representing quantities with numerals.

Trial 1 page 11
1. 122
2. 321
3. 500
4. 304
5. 281

Trial 2 page 12
1. 113
2. 745
3. 805
4. 920

Module 5: Estimating quantities.

Trial 1 page 13
1. Estimate number - Check on learners answer.
   Actual number – 75
2. Estimate number - Check on learners answer
   Actual number – 58
3. Estimate number - Check on learners answer.
   Actual number – 63
ANSWERS

Trial 2  page 14
1. Estimate number - Check on learners answer.  
   Actual number – 83
2. Estimate number – Check on learners answer  
   Actual number – 40

Trial 3  
Learners to do these.

Module 6: Describing position of numbers  
Trial 1  page 15
1. 67
2. 34, 29 and 88
3. 88
4. 26
5. 19

Trial 2  page 16
1. 877
2. 698 and 708
3. 475
4. 999
5. 887

Trial 3  page 17
1. 900
2. 21
3. 159 and 6
4. 30 and 54
5. 234

Module 7: Counting to find “how long” using non – standard unit.  
Trial 1  page 18
Learners to do these.

Trial 2  page 19
Learners to do these.

Trial 3  page 20
Learners to do these.

Module 8: Counting to find “how much” or “how many”  
Trial 1  page 21
1. Learners to do these.
2. 5

Trial 2  
1. Eight
2. One
3. True

Module 9: Place value  
Trial 1  page 22
1. a. 4 tens  6 ones  
   b. 6 tens  2 ones
2. a. 67 tens  7 ones  
   b. 25 tens  5 ones  
   c. 66 tens  6 ones  
   d. 95 tens  5 ones  
   e. 44 tens  4 ones  
   f. 28 tens  8 ones
3. Learners to do these.

Trial 2  page 23
1. 3 tens and 4 ones = 34
   4 tens 3 ones = 43
2. 5 tens and 2 ones = 52
   4 tens 2 ones = 42
3. 73 = 7 tens and 3 ones
4. 28 = 2 tens 8 ones
5. 65 = 6 tens and 5 ones
6. 91 = 9 tens 1 one

Trial 3  page 24
1. 

2. a. 262  
   b. 538

Module 10: Partitioning whole numbers.  
Trial 1  page 25
1. 6 ; 70  
   71 ; 6  
   53 3  
   159  
   321  
   206  
   864
2. 50 + 0  
   80 + 3  
   50 ; 3

Trial 2  
1. 50 + 0  
   2. 80 + 2  
   3. 20 + 8
4. 70 + 3  
   5. 30 + 3
**Module 12: Arranging objects in different ways.**

**Trial 1**

Learners to do these.

Trial 1

1. smaller than
2. more than
3. more than
4. more than
5. smaller than

**Trial 3**

Learners to do these.

Trial 3

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 13: Comparing whole numbers using >, < or =**

**Trial 1**

1. 50 < 80 + 5
2. 40 + 0 > 20 + 8
3. 71 < 70 + 7
4. 60 + 6 < 1 + 60

**Trial 2**

1. true
2. false
3. true
4. false
5. true

**Trial 3**

1. 89
2. 29
3. 57
4. 37
5. 89

**Module 14: Ordering whole numbers.**

**Trial 1**

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**

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**

1. a. 8 5 4
   b. 44
2. a. 9 7 3
   b. 66

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
**Module 16: Word problems involving comparison.**

**Trial 1**

1. Fatima has a lot less cola nuts than Amina or Amina has a lot more cola nuts than Fatima
2. Opoku has a lot less tennis balls than Asare, or Asare has a lot more tennis balls than Opoku
3. a, 40  b, Dzifa
4. Twenty-five (25)

**Trial 2**

1. Five (5) toffees
2. Twenty (20) oranges
3. Seventy-eight (78)

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

**Module 1: Addition of whole numbers.**

**Trial 1**

Match the addition sentence on the left to that on the right.

<table>
<thead>
<tr>
<th>Sentence on the Left</th>
<th>Sentence on the Right</th>
</tr>
</thead>
<tbody>
<tr>
<td>19 + 10</td>
<td>15 + 30</td>
</tr>
<tr>
<td>10 + 4</td>
<td>31 + 5</td>
</tr>
<tr>
<td>15 + 30</td>
<td>19 + 10</td>
</tr>
<tr>
<td>31 + 5</td>
<td>10 + 4</td>
</tr>
</tbody>
</table>

**Trial 2**

1. 15 + 5 + 8 = 8 + 5 + 15
2. 12 + 2 + 31 = 31 + 2 + 12
3. 26 + 4 + 53 = 53 + 4 + 26
4. 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
1. $70$
2. $30$
3. $90$
4. $19$
5. $38$

Trial 2 page 48
Learners to do these.

Trial 3 page 49
Q1 and 2 check on learners answers.

Q3
a. $52$
b. $34$
c. $5$
d. $0$

Module 5: Addition and subtraction of whole numbers using = and ≠ 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. ≠ 2. = 3. = 4. ≠ 5. ≠ 6. =

Module 6: Relationship between addition and subtraction.

Trial 1 page 53
1. 48 + 6 = 54 2. 63 + 9 = 72
54 – 6 = 48 72 – 9 = 63
54 – 48 = 6 72 – 63 = 9
3. 85 + 4 = 89 4. 37 + 12 = 49
89 – 4 = 85 49 – 37 = 12
89 – 85 = 4 49 – 12 = 37
5. 51 + 8 = 59 6. 70 + 10 = 80
59 – 8 = 51 80 – 10 = 70
59 – 51 = 8 80 – 70 = 10

Trial 2 page 54
1. 52 23 52 + 23 = 75
52 + 23 = 75 75 – 23 = 52
2. 27 41 14 3. 55 47 8
27 + 14 = 41 47 + 8 = 55
41 – 27 = 14 55 – 47 = 8
4. 63 25 38 5. 79 7 72
63 + 25 = 86 72 + 7 = 79
63 + 25 = 38 79 – 72 = 7

Accept other arrangements from learners. E.g.
1. 23 + 52 = 75
75 – 23 = 52

Trial 3 page 55
Learners to do these.

Module 7: Addition and subtraction facts

Trial 1 page 56
44 → 34; 73 → 63; 99 → 89;
26 → 16; 38 → 28; 57 → 47;
81 → 71; 27 → 17 100 → 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 → 14 16 → 17 19 → 20
2. Two more than
10 → 12 17 → 19 14 → 16
3. One less than
14 → 13 11 → 10 19 → 18
4. Two less than
17 → 15 11 → 9 20 → 18

Trial 4
1. 80 2. 3
89 90 91 88 90
5. 36 38 6. 63 65

Module 8: Double of numbers (1 – 12)

Trial 1 page 58
1. 4 + 4 = 8 2. 6 + 6 = 12
3. 5 + 5 = 10 4. 8 + 8 = 16
5. 7 + 7 = 14

Trial 2
1. 4 2. 10
3. 12 4. 20
5. 16 6. 6

Trial 3 page 59
1. 4: 8 2. 6: 12
3. 8: 16 4. 5: 10
5. 12: 24

Trial 4
1. 8 2. 12
3. 22 4. 20
5. 16
Module 9: Addition and subtraction facts (fluency 2)

**Trial 1** page 60
1. 6
2. 1
3. 0
4. 8
5. 3

**Trial 2** page 61
1. 15
2. 11
3. 15
4. 4. Learners to do these.
5. 3

**Trial 3** page 64
1. 6
2. 8
3. 19
4. 8
5. 18

Module 10: Addition and subtraction facts 2 (fluency 3)

**Trial 1** page 62
1. 7 + 5 = 12
2. 9 + 6 = 15
3. 8 + 8 = 16
4. 6 + 2 + 8 = 16
5. 3 + 7 + 10 = 10
6. 4 + 6 + 1 = 13

**Trial 2** page 63
1. 2 + 3
2. 2 + 2 + 1 = 5
3. 8 + 9
4. 8 + 8 + 1 = 17
5. 7 + 8
6. 7 + 7 + 1 = 15
7. 1 + 2
8. 1 + 1 + 1 = 3
9. 8 + 7
10. 8 + 8 − 1 = 15

**Trial 3** page 64
1. 6 + 5
2. 6 + 6 − 1 = 11
3. 2 + 1
4. 10 + 9
5. 5 + 4
6. 5 + 5 − 1 = 9
7. 8 + 7
8. 8 + 8 − 1 = 15

Module 11: Subtraction strategies

**Trial 1** page 65
1. 3
2. 11
3. 6
4. 19
5. 13
6. 15
7. 1
8. 1
9. 18

**Trial 2**
1. 5
2. 5
3. 6
4. 11
5. 11

**Trial 3** page 66
1. 3
2. 4
3. 4
4. 7
5. 5

**Trial 4**
1. 1
2. 4
3. 4
4. 8

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

**Trial 1** page 67
1. 60 + 20 = 80
2. 56 + 33 = 89
3. 43 + 33 = 76

**Trial 2** page 68
1. 80 + 19 = 99
2. 35 + 22 = 57
3. 47 + 24 = 71

**Trial 3** page 69
1. 38 + 50 = 88
2. 72 + 25 = 97
3. 64 + 22 = 86
4. 18 + 80 = 98
5. 13 + 52 = 65

Module 13: Subtraction of whole numbers (within 100)

**Trial 1** page 70
1. 44
2. 53
3. 62
4. 20
5. 33

**Trial 2** page 71
1. 38
2. 8
3. 17
4. 46
5. 47
6. 32
7. 51
8. 65
9. 13
10. 33

**Trial 3** page 72
1. 23
2. 26
3. 2
4. 17
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

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 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 17: Personal strategies for subtraction (2)

Trial 1 page 82

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. $\boxed{13 + 13 = 57} = 44$
4. $26 + 52 = 78$
5. $37 + 25 = 62$

Module 19: Word problems involving subtraction (within 100)

Trial 1 page 90
1. $98 - 35 = 63$
2. $59 - 32 = 27$
3. $85 - 73 = 12$
4. $48 - 25 = 23$

Trial 2 page 91
1. $69 - 42 = 27$
2. $18 + 12 - 13 = 17$
3. $14 + 34 - 16 = 32$
4. $25$

Trial 3 page 93
1. $27 + 14 - 15 = 26$
2. $67 - 28 + 15 = 54$
3. $86 - 37 = 49$
4. $81 - 29 = 52$
Sub Strand 3 FRACTION
Module 1: Making halves
Trial 1 page 95
Learners to do these.

Trial 2 page 96
1. 8
2. 10
3. 6
4. 4

Module 2: Making quarters
Trial 1 page 97
1. 1, 3, 4, 6 and 8 → quarters.
2. 2, 5, 7, 9 and 10 → not quarters

Trial 2 page 98
Learners to do these.

Trial 3
Learners to do these.

Trial 4 page 99
1. 16
2. 20
3. 12
4. 8

Module 3: Halves and quarters of an amount.
Trial 1 page 100
1. Shade 5 squares  2. 6 squares
2. 7 squares  4. 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  8. GH₵ 1
9. 10 p  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
Module 3: Finding missing terms in patterns

Trial 1 page 113
1. 18 20 22 24 26 28 30
2. 37 42 47 52 57 62 67
3. 59 61 63 65 67 69 71
4. 44 54 64 74 84 94 104
5. 9 13 17 21 25 29 33
6. 21 25 29 33 37 41 45
7. 4 13 22 31 40 49 58
8. 45 48 51 54 57 60 63

Trial 2 page 114
1. 53 51 49 47 45 43 41
2. 85 80 75 70 65 60 55
3. 96 86 76 66 56 46 36
4. 61 59 57 55 53 51 49
5. 42 37 32 27 22 17 12

Trial 3
1. 37 35 33
2. 37 32 27
3. 45 35 25

Module 4: Identifying and describing rules for patterns

Trial 1 page 115
1. 18; Add 2
2. 45; Add 2
3. 78; Add 5
4. 88; Add 10

Trial 2 page 116
1. 20; Subtract 5.
2. 22; Subtract 10
3. 56; Subtract 2
4. 75; Subtract 5

Trial 3 page 117
Learners to do these.

Trial 4 page 118
1. 65 67 69 71 73 75
2. 42 52 62 72 82 92
3. 83 73 63 53 43 33
4. 35 33 31 29 27 25
5. 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 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 (rectagles)
5. pentagon → i, q
6. hexagons → d, p

Trial 2 page 125
1. Circle
2. Rectangle
3. Hexagon
4. Triangle
5. 4
6. 4
7. 1
8. 5
Trial 3

<table>
<thead>
<tr>
<th>Number of straight sides</th>
<th>Number of curved sides</th>
<th>Number of corners</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
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</tr>
<tr>
<td>4</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
<td>0</td>
</tr>
</tbody>
</table>
Module 5: Standard unit for measuring length

**Trial 1**  page 142
1. a. 10 paper clips  4 pencils
   b. Paper clips. They are shorter.
2. a. 16 blocks  22 beads
   b. Blocks. They are longer.

**Trial 2**  page 143
Learners to do these.

**Module 6: Reading the calendar**

**Trial 1**  page 144
1. Learners to do these.
2. 10th July 2019 to 16th July 2019.
3. 18th July 2019 to 31st July 2019, 14 days  2 weeks.

**Trial 2**  page 145
1. The 3rd month of the year → March
   The month after September → October
   The month before December → November
   The last month of the year → December

2. 12
3. 1
4. April  August
   March  May

**Module 7: Measuring time using arbitrary units**

**Trial 1**  page 146
1. b
2. a
3. a

**Trial 2**  page 147
Learners to do these.

**Trial 3**
1. Check on learners’ answers.
2. minutes
3. hours

**Module 8: Relationship between units of time.**

**Trial 1**  page 148
1. 30 minutes → half an hour;
2. quarter of an hour → 15 minutes;
3. 60 seconds → 1 minute;
4. 180 seconds → 3 minutes.
5. 60 seconds
6. 120 seconds
7. 24 hours
8. 720 minutes
9. 36 months
10. 4 weeks
11. 8 weeks

**Trial 2**  page 149
1. 300 seconds
2. 30 minutes
3. 240 hours
4. 15 minutes
5. 2880 minutes
6. 48 hours
7. 30 seconds
8. 360 minutes
9. 108 hours
10. 120 hours

**Trial 3**  page 150
1. A  1: 30  1
   B  7: 45  8
   C  9 o'clock or 9:00
   D  4:15,  a quarter past 4
2. a. check on learners answers
   b. 15 minutes
3. a. check on learners answers
   b. 30 minutes

**Trial 4**  page 151
1. a. 9:00
   b. 9:15 or a quarter past 9 o’clock
   c. 15 minutes
2. 1 : 30 (half past one)
3. 10: 30 (half past ten)
4. 9 :30 (half past nine)
5. 6 : 30 (half past six)
6. 5 : 30 (half past five)
7. 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

<table>
<thead>
<tr>
<th></th>
<th>Flower</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>red flower</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>yellow flower</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>White flower</td>
<td>26</td>
</tr>
</tbody>
</table>

2. 79  
4. red flower

Trial 2 page 155
1. 24  
2. 24  
3. 37  
4. 18  
5. 55  

12

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 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.

**The Teacher’s Guide offers to the teacher:**
- Clear directives on activities and lesson plans
- Additional recommended activities for better transfer of knowledge
- Answers to all exercises, test and assessments.

**ESSENTIAL, your guarantee of success!**