ESSENTIAL Mathematics

Primary 3

Teacher's Guide

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Teacher's Guide

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Mathematical Association of Ghana

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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)

Time allocation

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

Classroom management

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

Group work

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

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

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

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

Pair work

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

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

Individual work

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

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

Learning areas (Strands)

Strand 1: Number

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

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

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

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

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

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

Strand 2: Algebra

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

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

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

Strand 3: Geometry and Measurement

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

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

Strand 4: Data

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

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

Assessment

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

Forms of Assessment

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

Formative assessment
refers to a wide variety of methods that teachers use to conduct in-process evaluations of student comprehension, learning needs, and academic progress during a lesson, unit, or course. Formative assessments help teachers identify concepts that students are struggling to understand, skills they are having difficulty acquiring, and addressing these challenges.

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

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

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

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

Core competencies

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

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

The six core competencies identified for all Ghanaian learners are:

Critical thinking and Problem Solving (CP)

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

Creativity and Innovation (CI)

Promoting economic and social 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 mathsematical 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 mathsematical 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 Leardership (PL)

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

Digital Literacy (DL)

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

Expectations of a Basic 3 Mathematics learner

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

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

NUMBER

Number: Counting, Representation, Cardinality & Ordinality

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

Number Operations

- Use standard strategy or procedure to do addition or subtraction within 1000.
- Use the concept of "equal to" and "not equal to".
- Use strategies to mentally add and subtract whole numbers within 100.
- Use a variety of personal strategies for adding within 1000.
- Use a variety of personal and standard strategies to solve different types of subtraction and addition equations and problems with missing numbers in all positions.
- Use strategies to mentally add and subtract whole numbers within 100.
- Develop and explain estimation strategies to estimate the solution for a given word problem involving addition or subtraction sums up to 1000.
- Show an understanding of the property of commutativity.
- Represent and explain multiplication using equal groupings.
- Represent and explain multiplication using rectangular arrays.
- Use concrete and pictorial representations to explain division as equal sharing or partitioning equally into given groups and finding how many are in each group.
- Use concrete and pictorial representations to explain division as repeated subtraction or determining the number of times given equal groups can be obtained in.
- Use concrete and pictorial representation to explain division as inverse of multiplication.

Fractions

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

Money

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

ALGEBRA

Patterns and Relationship

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

GEOMETRY AND MEASUREMENT

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

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

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

Expectations of a Basic 3 Teacher

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

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

SCOPE OF THE SUB-STRANDS

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

Source: NaCCA, Ministry of Education 2019

SAMPLE YEARLY SCHEME OF LEARNING – BASIC 13

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

Source: NaCCA, Teacher Resource Pack - 2019

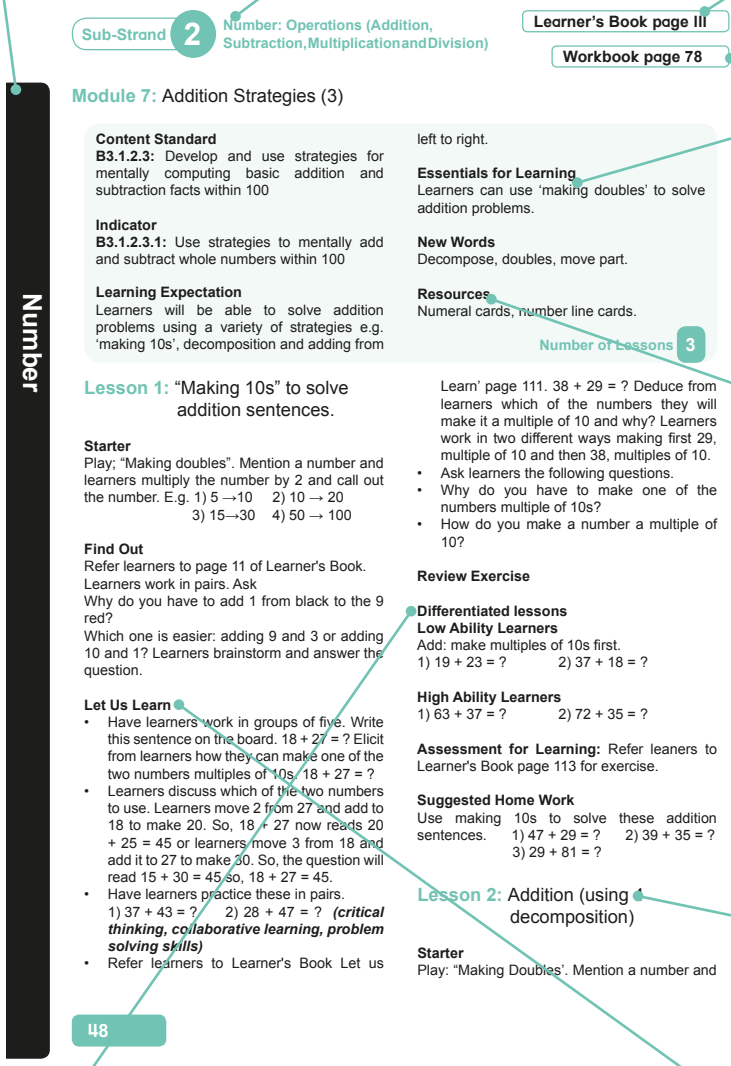
Structure of the Teacher's Guide

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

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

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

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



Number

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

Learner's Book page 111

Workbook page 78

Module 7: Addition Strategies (3)

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

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

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

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

New Words
Decompose, doubles, move part.

Resources
Numeral cards, number line cards.

Number of Lessons 3

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

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

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

Let Us Learn
- Have learners work in groups of five. Write this sentence on the board. 18 + 27 = ? Elicit from learners how they can make one of the two numbers multiples of 10s. 18 + 27 = ?
- Learners discuss which of the two numbers to use. Learners move 2 from 27 and add to 18 to make 20. So, 18 + 27 now reads 20 + 25 = 45 or learners move 3 from 18 and add it to 27 to make 30. So, the question will read 15 + 30 = 45 so, 18 + 27 = 45.
- Have learners practice these in pairs. 1) 37 + 43 = ? 2) 28 + 47 = ? ***(critical thinking, collaborative learning, problem solving skills)***
- Refer learners to Learner's Book Let us Learn' page 111. 38 + 29 = ? Deduce from learners which of the numbers they will make it a multiple of 10 and why? Learners work in two different ways making first 29, multiple of 10 and then 38, multiples of 10.
- Ask learners the following questions.
- Why do you have to make one of the numbers multiple of 10s?
- How do you make a number a multiple of 10?

Review Exercise

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

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

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

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

Lesson 2: Addition (using decomposition)

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

48

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 assesment.

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.

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

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.

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

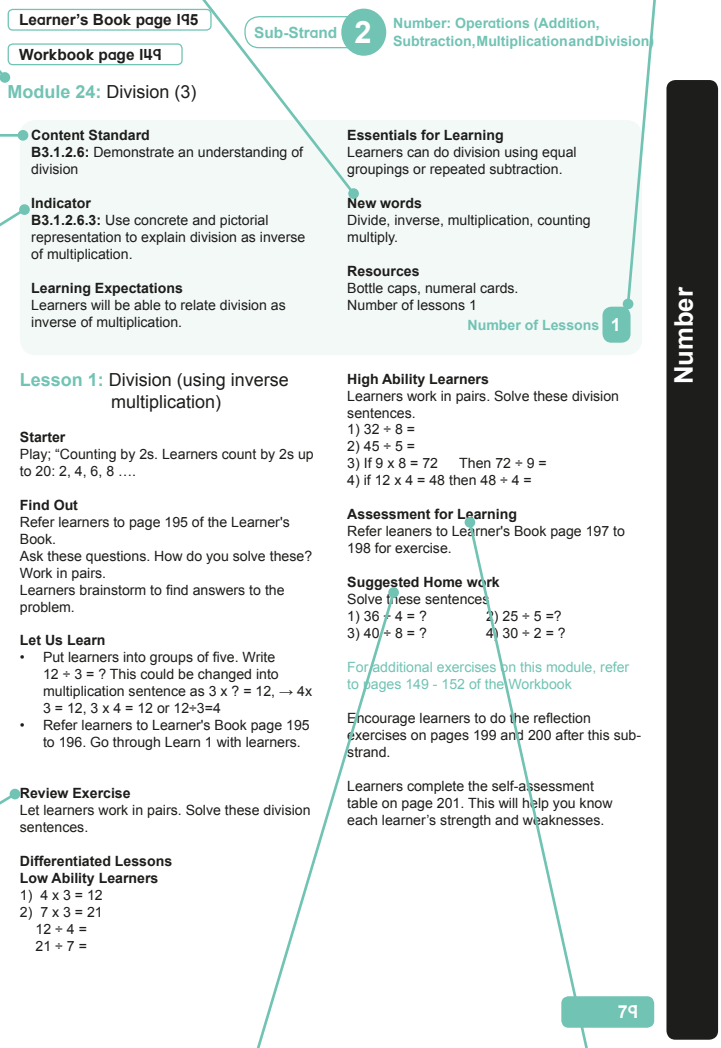
New words
Every lesson in the series identifies key words that learners are expected to know and use appropriately. These are relevant to the lesson.

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

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

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

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



Learner's Book page 195
Workbook page 149
Sub-Strand 2 Number: Operations (Addition, Subtraction, Multiplication and Division)
Module 24: Division (3)

Content Standard
B3.1.2.6: Demonstrate an understanding of division

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

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

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

New words
Divide, inverse, multiplication, counting multiply.

Resources
Bottle caps, numeral cards.
Number of lessons 1

Number of Lessons 1

Lesson 1: Division (using inverse multiplication)

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

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

Let Us Learn
- Put learners into groups of five. Write 12 ÷ 3 = ? This could be changed into multiplication sentence as 3 x ? = 12, → 4x 3 = 12, 3 x 4 = 12 or 12÷3=4
- Refer learners to Learner's Book page 195 to 196. Go through Learn 1 with learners.

Review Exercise
Let learners work in pairs. Solve these division sentences.

Differentiated Lessons
Low Ability Learners
1) 4 x 3 = 12
2) 7 x 3 = 21
12 ÷ 4 =
21 ÷ 7 =

High Ability Learners
Learners work in pairs. Solve these division sentences.
1) 32 ÷ 8 =
2) 45 ÷ 5 =
3) If 9 x 8 = 72 Then 72 ÷ 9 =
4) if 12 x 4 = 48 then 48 ÷ 4 =

Assessment for Learning
Refer leaners to Learner's Book page 197 to 198 for exercise.

Suggested Home work
Solve these sentences
1) 36 ÷ 4 = ?
2) 25 ÷ 5 =?
3) 40 ÷ 8 = ?
4) 30 ÷ 2 = ?

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

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

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

Number

79

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

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 neccesary.

Learning Expectation

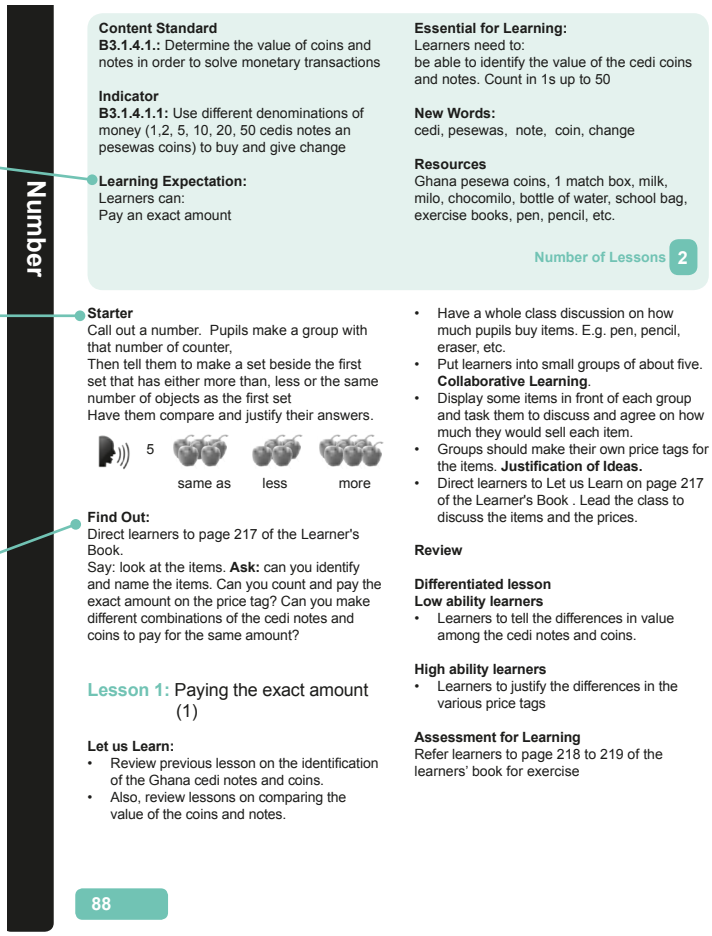
Are provided to help both teachers and learners identify what learners are required to know, understand and do in order to achieve the learning indicator(s).

Starter

Recommended teaching time: 5 min.
Identifies some mental math (games) activities that reinforce concepts learnt. Starters help in preparing learners for new skills, methods or concepts, reinforcing previous steps necessary for this new learning/ lesson.

Find Out

Recommended teaching time: 10 min.
Teases learners knowledge on the 'big idea' of the lesson. This feature is intended to act as a foundation for discussion and investigation and is aimed at getting the learners engaged in the lesson. It helps learners discover by thinking critically.



Number

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

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

Learning Expectation:
Learners can:
Pay an exact amount

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

New Words:
cedi, pesewas, note, coin, change

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

Number of Lessons 2

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

5 — same as — less — more

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

Lesson 1: Paying the exact amount (1)

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

Review

Differentiated lesson
Low ability learners
- Learners to tell the differences in value among the cedi notes and coins.

High ability learners
- Learners to justify the differences in the various price tags

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

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Answers

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

ANSWERS — Workbook

Strand 1: Number
Sub-Strand 1: Number: Counting, Representation, Cardinality and Ordinality
Module 1: Number names
Trial 1 Page 2
1 1,000
2 1,200
3 4,540
4 2,806
5 3,115

Trial 2
1 One thousand four hundred and fifty six
2 Three thousand and seventy three
3 Two thousand five hundred and seven
4 Four thousand four hundred and forty four
5 Five thousand

Trial 3 Page 3
1 6,075
2 10,000
3 8,541
4 9,266

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

Module 2: Counting Sequence (1)
Trial 1 Page 5
1 17, 19, 22, 23
2 57, 58, 61, 62
3 97, 94, 93, 90
4 213, 212, 210, 209, 207
5 1,004, 1,006, 1,008, 1,009
e 90, 100
f 110, 120
2 934, 944, 954, 964, 974, 984.

Trial 4 Page 7
1 66, 36, 26, 16
2 90, 80, 60, 30
3 610, 600, 580, 570
4 1522, 1502, 1482, 1462

Module 3: Counting Sequences (2)
Trial 1 Page 8
1 505, 705
2 1792, 2092
3 5737, 5537
4 679, 479
5 4615, 4815

Trial 2 Page 9
1 750, 1250, 1750, 2250, 2750, 3250, 3750.
2 623, 1123, 3123.
3 67
4 5050
5 8500, 8000, 7500, 7000, 6500, 6000, 5500

Trial 3 Page 10
1 9,600, 8,600, 7,600, 6,600, 5,600, 4,600, 3600.
2 642, 1,642, 2,642, 3,642, 4,642, 5,642, 6,642
3 590, 1,590, 4590, 5,590
4 8,000, 7,000, 6,000, 5000, 4000
5 3801, 6801, 7801, 8801, 9801

Module 4: Estimation quantities
Trial 1 Page 11

Learner's Book — ANSWERS

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

Module 1: Number names

Exercise 1 Page 9
1 b 2 a 3 c 4 b 5 a

Exercise 2 Page 10
1 → d 2 → e 3 → a 4 → b 5 → c

Module 2: Counting Sequence (1)
Exercise 1 Page 14
1 36, 38, 39 and 41
2 98, 97, 95 and 93
3 88, 91, 92 and 94
4 46, 49, 50 and 53
5 102, 101, 98 and 96

Exercise 2 Page 15
1 235, 255, 265 and 285
2 733, 713, 703 and 683
3 556, 526, 496 and 486
4 989, 979, 959 and 949
5 750

Exercise 3 Page 16
1 856, 806, 706 and 656
2 351, 401, 551 and 601
3 354 and 555
4 8 numbers
5 968, 918, 868, 818, 768 and 718

Module 3: Counting Sequences (2)

Exercise 3 Page 21
1 1129, 2129, 3129, 4129, 5129, 6129
2 712, 1712, 2712, 3712, 4712, 5712, 6712
3 456, 1456, 2456, 3456, 4456, 5456, 6456
4 3140, 4140, 5140, 6140, 7140, 8140, 9140
5 200, 1200, 2200, 3200, 4200, 5200, 6200

Module 4: Estimation quantities
Exercise 1 Page 23
1 Estimate – Learner's answer Actual count – 38
2 Estimate – Learner's answer Actual count – 99
3 Estimate – Learner's answer Actual count – 54
4 Estimate – Learner's answer Actual count – 44
5 Estimate – Learner's answer Actual count – 64
6 Estimate – Learner's answer Actual count – 48

Module 5: Representing numbers or quantities with numerals
Exercise 1 Page 24
1 683
2 852
3 455
4 974
5 1000

Exercise 2 Page 28
1 623
2 841
3 362
4 903
5 1000

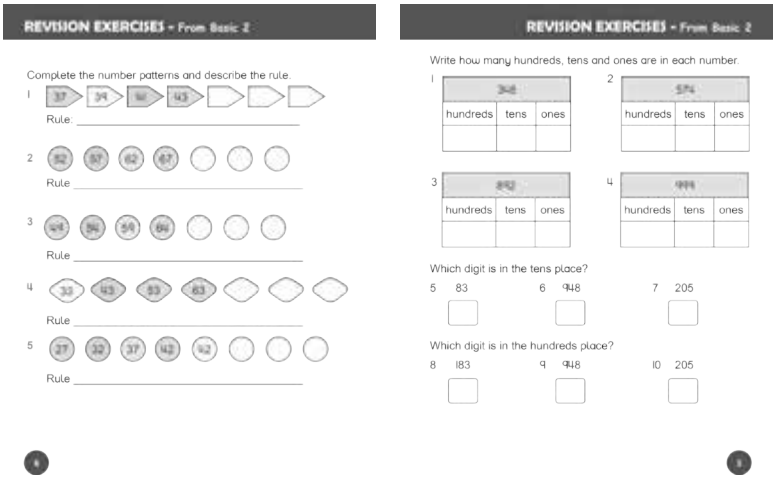
Module 6: Writing number names
Exercise 1 Page 33

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.

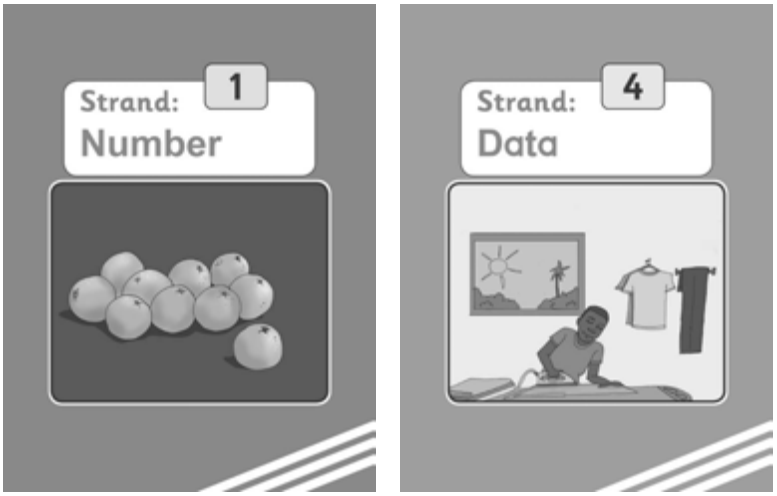
Revision Exercises - *From basic 2*

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



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.

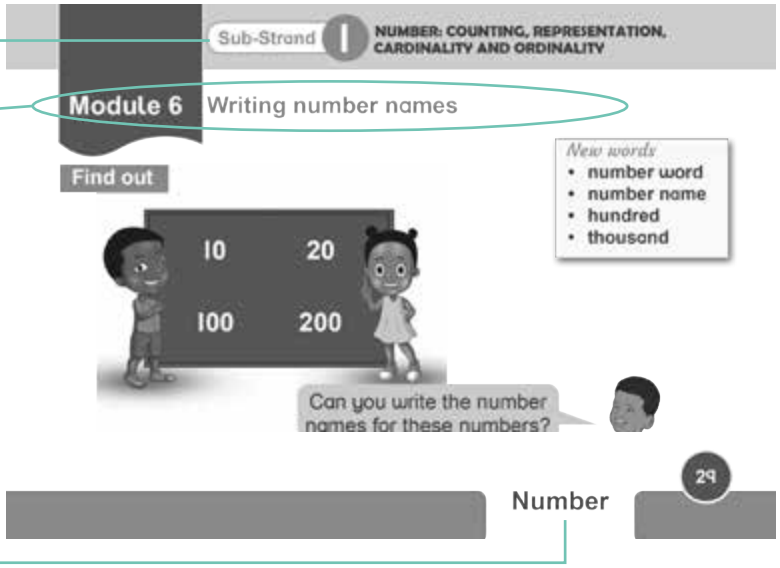


Header and footer labels

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

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.

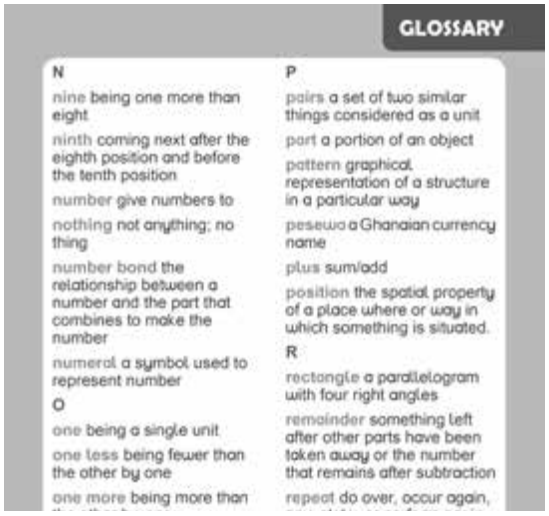


New words and a Glossary

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**



GLOSSARY

N

nine being one more than eight

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

number give numbers to

nothing not anything; no thing

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

numeral a symbol used to represent number

O

one being a single unit

one less being fewer than the other by one

one more being more than

P

pairs a set of two similar things considered as a unit

part a portion of an object

pattern graphical representation of a structure in a particular way

pesewa a Ghanaian currency name

plus sum/add

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

R

rectangle a parallelogram with four right angles

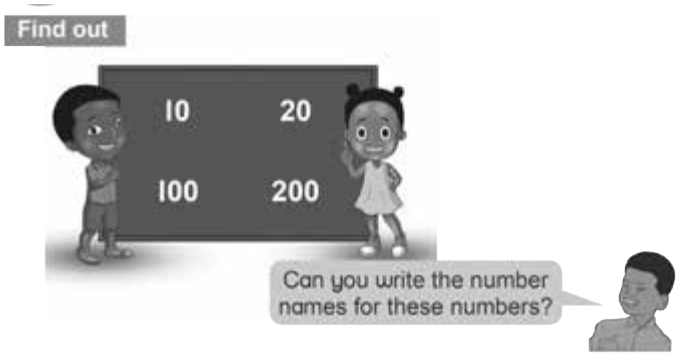
remainder something left after other parts have been taken away or the number that remains after subtraction

repeat do over, occur again,

Find out

Recommended time: 10 minutes.

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



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: 1

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

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

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

Let us do an activity

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

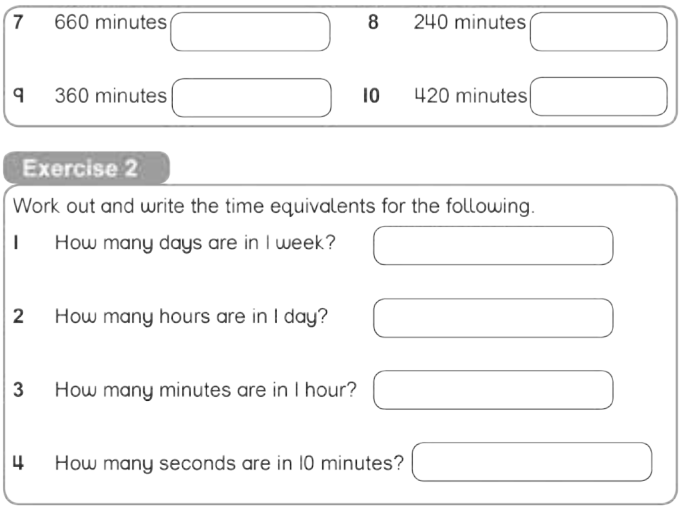
Let us do an activity

Work in pairs

Work with a partner?
You will need a stop watch, two containers, sand and a spoon.
Ask your partner to time you. How many spoons of sand can you fetch into the container in 1 minute. Let your partner count.
Do this activity together.
How many spoons could you fetch together in 2 minutes.

Exercise

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



7 660 minutes ____ 8 240 minutes ____

9 360 minutes ____ 10 420 minutes ____

Exercise 2

Work out and write the time equivalents for the following.

1 How many days are in 1 week? ____

2 How many hours are in 1 day? ____

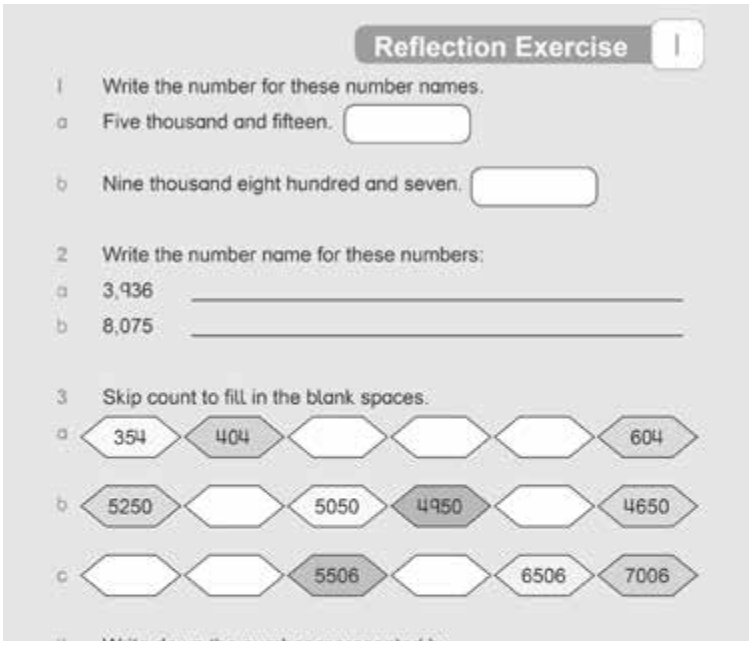
3 How many minutes are in 1 hour? ____

4 How many seconds are in 10 minutes? ____

Reflection Exercise

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

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



Reflection Exercise 1

1 Write the number for these number names.

a Five thousand and fifteen. ____

b Nine thousand eight hundred and seven. ____

2 Write the number name for these numbers:

a 3,936 _____

b 8,075 _____

3 Skip count to fill in the blank spaces.

a 354, 404, ____, ____, ____, 604

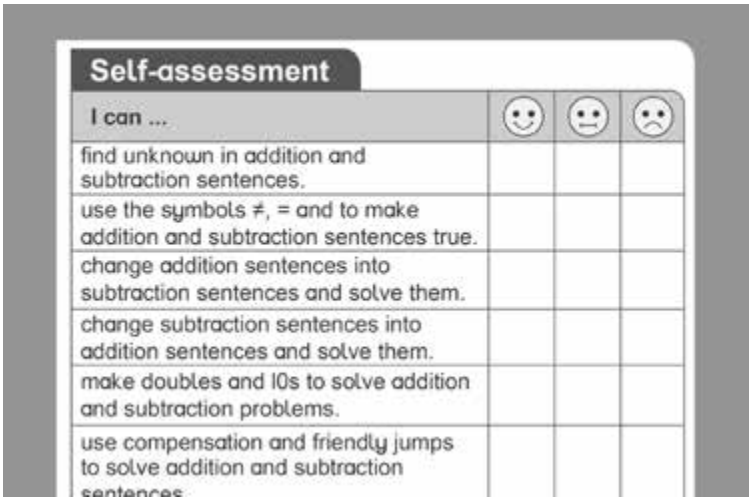
b 5250, ____, 5050, 4950, ____, 4650

c ____, ____, 5506, ____, 6506, 7006

Self-assessment

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

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



Self-assessment

I can ...	☺	😐	☹
find unknown in addition and subtraction sentences.			
use the symbols ≠, = and to make addition and subtraction sentences true.			
change addition sentences into subtraction sentences and solve them.			
change subtraction sentences into addition sentences and solve them.			
make doubles and 10s to solve addition and subtraction problems.			
use compensation and friendly jumps to solve addition and subtraction sentences			

Strand: 1

Number

Module 1: Number names

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

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

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

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

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

Resources
Place value chart, number chart.

Number of Lessons 2

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

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

Find Out
Refer to Learner's Book page 8. Have learners look at the multi-based block and write the number name for each.
1) One thousand 2) Five thousand 3) Sixty 4) Four

Let Us Learn
Draw the Place Value Chart on the board.

Ten thousand	Thousand	Hundred	Tens	Ones
1	2	4	6	
3	6	0	4	

- Have learners be in groups of five. Write these numbers on the board.
- Learners read it and write the numerals under the appropriate columns: 1, 2 4 6.
- Learners read it as one thousand two hundred and forty-six. Write 3,604 on the board.
- Learners write it under the hundred frame: Learners write the number name for it i.e. Three thousand six hundred and four. ***(critical thinking, collaborative learning).***
- Give out the place value chart to learners. They write numeral on their own and write it under the appropriate column in the place value chart. ***(critical thinking, collaborative learning)***
- Refer to learners back page 8. Go through the exercises with learners. They write the numerals under the chart and write the number name for it.

Review Exercise.

Differentiated Lessons
Low Ability Learners
- Write the number name for these numerals.
  1) 645 2) 1,332

High Ability Learners
- Write the number names for these numerals.
  1) 4999 2) 4005 3) 3079

Assessment For Learners: Refer learners to Learner's Book page 8 for exercise.

Suggested Home Work
Write the number names for these numerals
1) 3,685 2) 4,789 3) 369 4) 4906

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

Starter
Learners count multiple of 100 up to 1000 and clap simultaneously.

Ten thousand	Thousand	Hundred	Tens	Ones	
	5	8	9	6	→ Five thousand eight hundred and ninety-six.
	6	0	3	5	→ Six thousand and thirty-five.
1	0	0	0	0	→ Ten thousand

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

Review Exercise

Differentiated Lessons
Low Ability Learners
- Learners work in pairs. Write number names for these numerals.
  1) 5,648 2) 6,099

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

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

Assessment For Learners
Refer learners to Learner's Book page 9 for exercise.

Suggested Home Work
Write number names for these numerals.
1) 8,764 2) 9,065 3) 648 4) 4,404

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

Module 2: Counting sequence (1)

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

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

Learning Expectation
Learners will be able to count forwards by 10's.

Essentials For Learning
Learners can count forwards by 10's up to 1000.

New words
Count, forwards, backwards, skip count.

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

Number of Lessons 2

Lesson 1: Counting forwards by 10s up to 1000.

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

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

Let Us Learn
- Revise counting forwards and backwards by 1s with the closs. Refer to Let us Learn:1 of page 11 of the Learner's Book.
- Put learners into groups of five. Give them 100 number charts. learners skip count in columns in 10s starting on 2,3,4,5,6,7,8,9,10.
- The group leaders should identify errors or omissions and correct them. ***(critical thinking, collaborative learning, leadership skills)***
- Give 1000 numeral cards to learners in their groups. They play counting forwards in 10s starting on 200, 800, 900 etc.
- Deduce from learners a pattern or trend that they have identified when they were counting forwards in 10's.

The digit in the tens column increases by 1 when counting forwards.
- Refer learners to Learner's Book page 11. Let us Learn: 1. Go through the exercise with learners.

2. Have learners start on 22 and skip count forwards in 10s as 22, 32, 42, 52…..

Review Exercise.

Differentiated Lessons.
Low Ability Learners
- Have learners work in pairs. Give them 100 numeral charts. They skip count forwards in 10s starting from any number.

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

Assessment For Learners
Refer learners to Learner's Book page 14 for exercise.

Suggested Home Work
1. Write multiples of 10s from 80 – 200.
2. Write multiples of 10s from 400 – 600.

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

Starter
Count forwards and backwards in 10's up to 100.

Let Us Learn

- Call out 10 learners to the front of the class. Make sure you cater for gender and social inclusiveness. Give each of them multiples of 10 numeral cards. They hold from 100 – 10. Each learner reads his/her number.
  100 90 80 70 60 50
  40 30 20 10
  (personal development, attention to precision, collaborative learning)
- Give out the 100 numeral chart to learners in their groups. They skip count backwards by 10s starting from different numbers. Give them the 1000 numeral cards to repeat the same above. ***(collaborative learning, personal development, attention to precision)***
- Refer learners to page 13 of their Learner's Book. They skip count backwards from 137 up to 57. Elicit from learners what they have identified as they count backwards by 10's.

The digit in the tens place is decreasing by 1 ***(critical thinking, collaborative learning, justification of ideas)***

Review Exercise.

Differentiated Lessons.
Low Ability Learners

- Give out 10 numeral charts to learners, they skip count backwards by 10s from any number.

High Ability Learners

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

Assessment For Learners: Refer learners to Learner's Book page 15 for exercise.

Suggested Home Work
1. Write multiples of 10 from 92 up to 12.
2. Write multiple of 10 from 300 up to 150.

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

Starter
Play "counting by 10's". Learners count forwards by 10's starting from 10 up to 100.

Let Us Learn

- Put learners into groups of five. (Make sure learners change their group members) at times
- Give them the 1000 numeral cards. Have learners skip count in 50s starting from 50 and 151 up to 1000. The selected leaders should make sure every learner participate actively. Draw a number line on the floor calibrate it in 50's. Have learners jump over it and count by 50's simultaneously.
- Refer learners to let us learn 3. Go throughthe exercise with them.

Review Exercise

Differentiated Lessons
Low Ability Learners

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

High Ability Learners

- Give out 1000 number charts to learners. Have them skip count from any number up to 1000.

Assessment For Learners: refer learners to Learner's Book page 16 for exercise.
Give out 1000 number charts to learners. Learners skip count by 50s from any number up to 1000.

Suggested Home Work
1.Write the multiples of 50 from 112 up to 500.
2.Write the multiples of 50 from 510 up to 1000.

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

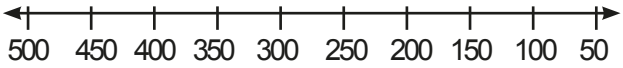
Starter

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

E.g. 5 →10 2) 3 →6 3) 4 →8 4) 10→20

Let Us Learn

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



(collaborative learning, personal development, attention to precision)

- Give out the 500 number charts to learners in their groups. They skip count backwards by 50s from 420 up to 120. Let them repeat the same activity with the 1000 number charts. They should start from any number.

Review Exercise

Differentiated Lessons

Low Ability Learners

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

High Ability Learners

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

Assessment For Learners

Refer learners to Learner's Book page 16 for exercise.

Suggested Home Work

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

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

Module 3: Counting sequences (2)

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

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

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

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

New Words
Increase, decrease, forwards, backwards.

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

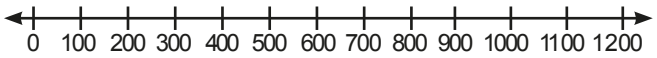
Number of Lessons 6

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

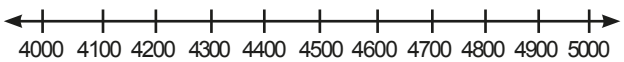
Starter: Play "10 more than". Mention a number and learners add 10 to the number.
E.g. 1) 10 → 20 2) 20 → 30
3) 60 → 70 4) 110 → 120

Find Out
Refer learners to page 17 of the Learner's Book. Have learners answer these questions.
1) What is Musa doing?
2) In what sequence is he counting?
3) Can you give the next 3 numbers?
4) What are they? ***(critical thinking problem solving skills, personal development)***

Let Us Learn
- Draw a number line on the board calibrate it in 100's.



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



- Learners listen carefully and identify and correct errors or omissions. (critical thinking, collaborative learning, attention to precision, problem solving skills)
- Refer learners to Learner's Book page 17. Have learners use their 1000 number chart. They skip count by 100s starting at 334 up to 3000. They should work in groups of four. Ask learners to tell you what they have identified as they skip count forwards by 100's.
- Counting forwards by 100s, we add 100 to get the next number. ***(critical thinking, collaborative learning, problem solving skills, attention to precision)***

Review Exercise

Differentiated Lessons
Low Ability Learners
- Give out 1000 number charts to learners. They skip count by 100s starting from any number.

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

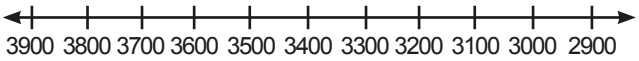
Assessment for Learning
Refer learners to Learner's Book page 19 for exercise.

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

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

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

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



- Give out 1000 number chart to learners in their groups. They skip count backwards in 100's from any number.

Review Exercise

Differentiated Lessons
Low Ability Learners
- Count backwards by 100's starting at 1,800 to 3000. Work in pairs.

High Ability Learners
- Learners work in pairs; they count backwards by 100s starting from 3,200 up to 5000.

Assessment For Learners
Refer learners to page 20 of the Learner,s Book for exercise.

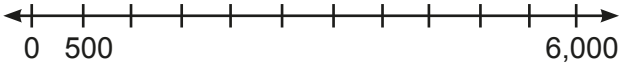
Suggested Home Work
Write multiples of 100 from 1,600 – 2000.
Write multiples of 100 from 5,140 – 1,100.

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

Starter
Play "100 more than". Mention a number and learners add 100 more to the number and call out the number. E.g.
1) 200→300 2) 650→750

Find Out
Refer learners to Learner's Book page 17. Find out. Learners should look at Ebo and answer these questions.
What multiples is Ebo counting on?
1. What would be the next 3 numbers for Abiba?
2. Learners work in pairs and brainstorm and come out with the answers. ***(critical thinking, collaborative learning, problem solving skills)***

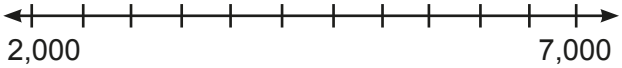
Let Us Learn
- Draw a number line on the board and calibrate it in 500s. Have learners count forwards by 500's.



- Give out number line cards which has been calibrated in 500s. Learners in pairs count forwards by 500's starting from any number. Learners identify their own errors and omission and correct themselves. ***(critical thinking, collaborative learning, problem solving skills)***

Review Exercise

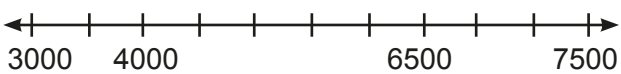
Differentiated Lessons
Low Ability Learners
- Give number line cards to learners to count forwards by 500's starting from any number.

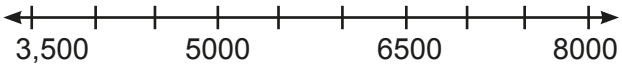


High Ability Learners
- Learners work in groups of 4. They draw number line, calibrate it in 500's starting from 300 – 6,000 and count in turns. (collaborative learning, critical thinking, problem solving skills)

Assessment For Learners
Refer learners to Learner's Book page 20 for exercise.

Suggested Home Work
Fill in the gaps.



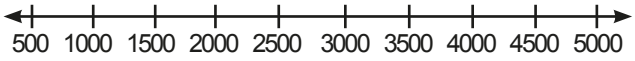


Lesson 4: Counting backwards by 500s up to 10,000

Starter: Play "10 more than". Mention a number and learners add 10 more and calls out the number.

Let Us Learn

- Draw a number line on the board calibrate in 500's.



- Learners use a pointer to skip count backwards by 500s from 5000 up to 500.
- Give out number line cards to learners in groups of six. They skip count by 500s starting at any number. ***(critical thinking, collaborative learning, attention to precision)***
- Refer to Learner's Book page 18. Have learners skip count by 500s starting from 2,000.

Review Exercise

Differentiated Lessons
Low Ability Learners

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

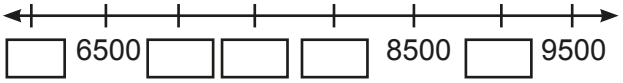
High Ability Learners

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

Assessment For Learners: Refer learners to Learner's Book page 20 for exercise.

Suggested Home Work
Fill in the missing numerals

1) 6,500 ☐ 5,000 ☐ ☐ 3,500



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

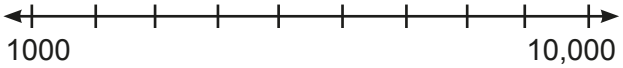
Starter
Play "counting by10s" up to 100. Learners count 10, 20, 40, 50 …100 and clap simultaneously.

Find Out
Refer learners to learners' book page 17. Learners look at Ebo and tells what he is doing. Have learners work in pairs and answer these questions.

3. Is Ebo counting forward or backwards?
4. What sequence is he counting on?
5. Say the next 3 numbers that Ebo has to count? ***(critical thinking, collaborative learning, problem solving skills)***

Let Us Learn

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



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

1,500	2,500	3,500	4,500
5,500	6,500	7,500	8,500

- Refer learners to Learner's Book page 18. Learners count forwards by 1000s 1234 up to 10,000.

Review Exercise

Differentiated Lessons
Low Ability Learners

- Give out number line cards for learners to count forwards by 1000s from any number to 10,000.

High Ability Learners

- Learners write multiples of 1000 from 6,800 up to 10,000.

Assessment For Learners
Refer learners to page 21 of the Learner's Book for exercise.

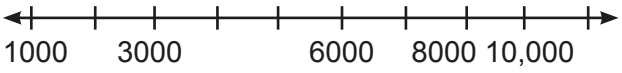
Suggested Home Work
Write multiples of 1000 from 2200 up to 10,000.

Lesson 6: Counting backwards by 1000s up to 10,000.

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

Let Us Learn

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



(attention to precision, leadership skills)

- Learners work in pairs, they count by 1000 starting from these numbers.
  E.g. 2,200 3,200 4,200 9,200 …. Up to 10,000.
- **In pairs, one learner starts counting by 1000's from any number whilst the partner listens attentively and correct errors and omissions. They rotate.** ***(collaborative learning, critical thinking, personal development, leadership skill)***
- Refer learners to Learner's Book page 18. Learn 3. Learners count backwards by 1000's. They start at 9450 and count back to 1,450.

Review Exercise

Differentiated Lessons
Low Ability Learners

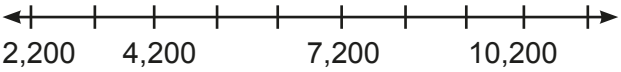
- Learners work in groups of six. They make a circle and count from 1000 up to 5000. Learners correct errors and omissions as they skip count the sequence.

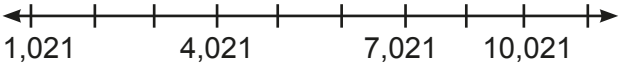
High Ability Learners

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

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

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





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

Module 4: Estimating Quantities

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

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

Learning Expectations
Learners will be able to give a sensible estimate of a number of objects in groups.

Essentials For Learning
Learners can guess whether it will rain or not.

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

Resources
Bottle caps, pebbles, bowls/caps, seeds,

Number of Lessons 1

Lesson 1: Estimating number of objects in groups.

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

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

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

Review Exercise
Work in groups of five. One uses the two hands to pick pebbles. Each learner in the group estimate and call out the number. They count to find out who got it right or a good estimate. They rotate the leaders until each person act as a leader. ***(critical learning, collaborative learning, attention to precision, leadership skill)***

Assessment For Learners
Refer learners to Learner's Book page 23 for exercise.

Suggested Home Work
Learners fill their cups with pebbles at home. They estimate, count and record and bring it to school the next day.
Estimate _____
Actual _____
Learners compare their work with their partners in their groups.

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

Module 5: Representing numbers or quantities with numerals

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

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

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

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

New Words
Numeral, quantities, number, hundreds, thousand, abacus

Resources
Abacus, multi based block, bottle caps.

Number of Lessons 1

Lesson 1: Representing quantities with numerals.

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

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

Let Us Learn
- Put learners into groups of five. They select a leader. The leader calls out a number and learners write the numeral. They compare their answers with the number of members in the group.
  E.g. 1) Fifteen → 15 2) Thirty-nine → 39
- Pick some multi based block. Show it to the class and they read and write numeral for it. E.g. 1 flat, 3 longs and 2 cubes is.132.
- Repeat this activity with different multi based block. ***(Critical Learning, Collaborative Learning, Attention to Precision)***
- Refer learners to Learner's Book page 26. Learners read the number on the abacus and write the numeral for it.
- Go through question 2 with learners. 2 flats, 3 longs and 4 cubes is 234. ***(Critical Learning, Collaborative Learning, Attention to Precision)***

Review Exercise

Differentiated Lessons
Low Ability Learners
- Work in pairs.
- Write numerals for these quantities.
- 6 longs and 4 cubes =
- 1 flat 3 longs and 2 cubes =

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

Assessment For Learning :
Refer learners to Learner's Book page 27 and 28 for exercise.

Suggested Home Work
Show these numbers on abacus
1) 68, 2) 129 3) 647 4) 999

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

Module 6: Writing number names

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

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

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

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

New Words
Number name/word, hundred, thousand.

Resources
Multi based block of tens, number words cards.

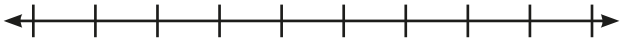
Number of Lessons 2

Lesson 1: Writing number names for multiples of 10.

Starter
Play: "10 more than" call out a number and learners add 10 to that number and call out the number. E.g. 1) 10 → 20 2) 16 → 26
3) 35 → 45 4) 60 → 70

Find Out
Refer learners to Learner's Book page 29. Have learners work in pairs. Elicit from them how to write the number words/names and let them write. They compare their work and correct wrong spellings. ***(Critical Learning, Collaborative Learning, Personal Development, Attention to Precision)***

Let us Learn
- Learners work in groups of five. Draw a number line on the board. label it with multiples of 10.



10 20 30 40 50 60 70 80 90 100

- Give out number name cards to learners in their groups. They read the numbers on the number line and pick a number name card to match it.
- Learners select a leader in their groups. He/she mentions a number and the rest look through the cards they have and pick the correct one. ***(Critical Learning, Collaborative Learning, Attention to Precision)***
- Refer learners to Learner's Book page 29. Learners count the objects, read the numeral and write the number names. Learners continue until they reach 100.

Review Exercise

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

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

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

Suggested Home Work
Write number names for these numerals.
1) 60 2) 120 3) 450 4) 810

Lesson 2: Writing number names for multiples of 100

Starter

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

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

Let Us Learn

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

Review Exercise

Differentiated Lessons

Low Ability Learners

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

High Ability Learners

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

Assessment For Learning

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

Suggested Home Work

Write number numerals for these numerals.
1) 500 2) 900 3) 1,800 4) 9,000

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

Module 7: Describing the position of numbers

Content Standard
B3.1.1.1 ` Count and estimate quantities from 0 to 10,000.

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

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

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

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

Resources
Number chart, number line cards.

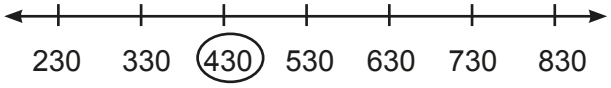
Number of Lessons 1

Lesson 1: Describing position of numbers.

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

Find Out
Refer learners to page 35 of the Learner's Book. Have learners look at the chart. Read the puzzle in pairs and identify the number which lies between 73 and 521. That number is 15. Have learners justify their answer.
(Problems Solving Skills, Critical Thinking, Collaborative Learning)

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



- Learners identify the circled number as 530
- They identify the number to the right and left of it. To the left the numbers are 430, 330 and 230. To the right the numbers are 630, 730 and 830.
- Give out number chart to learners in their groups. Circle 438. Write these questions on the board for learners to answer.
- What number is above me?
- What number is below me?
- Write the numbers to the left of me.
- Write the number which is to my right.
- Refer learners to Learner's Book page 35 to 36. Learners identify the "5010" and answer the questions that follows.

Review Exercise

Differentiated Lessons
Low Ability Learners
- Give out this number line card to learners. Circle 610. They write 2 numbers to right and left of it.

High Ability Learners
- Refer learners to Let Us Learn: at page 35 of the Learner's Book. Circle 3529
- Learners write one number above it, 2 numbers to the right and 2 numbers below it.

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

Suggested Home Work

Copy exercise 1. Increase each number by 100. Circle 114 and ask these questions.

"I am 114".

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

Write 2 numbers above me.
Write 2 numbers at my right side.
Which 2 numbers are below me? Write them.

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

Module 8: Relationship between numbers

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

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

Learning Expectations
Learners will be able to describe numbers and the relationship between numbers in equivalent ways using place value concept.

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

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

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

Number of Lessons 2

Lesson 1: Finding relationship between numbers. (Using multi-base-block)

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

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

Let Us Learn
- Write 687 on the board. learners expand or decompose it as 600 + 80 +7. Have learners work in pairs. They write their own 3-digit numbers and decompose them. ***(critical thinking, problems solving skills, collaborative learning)***
- Have learners work in pairs. Give out the multi-based block to each group to identify the values of the block, the flats, the rod and the unit.
- Call out a number and learners in their groups pick the multi-based block to represent it. E.g. 523. Learners pick 5 flats 2 longs and 3 units to represent it. The group that show stheirs first is commended. Repeat this game with different numbers up to one thousand. ***(critical thinking, problem solving skills, collaborative learning)***
- Refer learners to page 38 to 40 of the Learner's Book. Explain the values of each digit in the number 242 to learners.
  2 → 2 hundred 4→4 tens
  2 → 2 ones

Use the hundred- frame to explain as well.

Review Exercise

Differentiated Lessons
Low Ability Learners
- Have learners work in pairs. They use the multi based block to model these numbers.
  1) 632 2) 326 3) 308

High Ability Learners
- Model these 1) 432 2) 2,641
- Refer learners to Learners Book page ___ for exercise.

Assessment for Learning
Refer learners to page 42 for exercises.

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

Lesson 2: Finding relationship between numbers (using abacus)

Starter

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

1) 15 → 5 2) 28 → 18 3) 110 → 100

Let Us Learn

- Put learners into groups of five. Have learners model these numbers using the multi-base. 1) 268 2) 2,654 3) 1,990 ***(Critical Thinking, Problems Solving Skills, Collaborative Learning)***
- Give out the abacus to learners and the pierced bottles cups to learners. Have learners discuss in their groups the colours of the bottle caps they will use to represent the thousands, the hundreds, the tens and the ones. Write 527 on the board. Learners model the number using the abacus. (draw)
- Repeat this activity with different numbers.
- Refer learners to Learner's Book page 41.
- In 548, the 5 means 5 hundred (500), the 4 means 4 tens (40) the 8 means 8 ones (8)

Review Exercise

Differentiated Lessons

Low Ability Learners

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

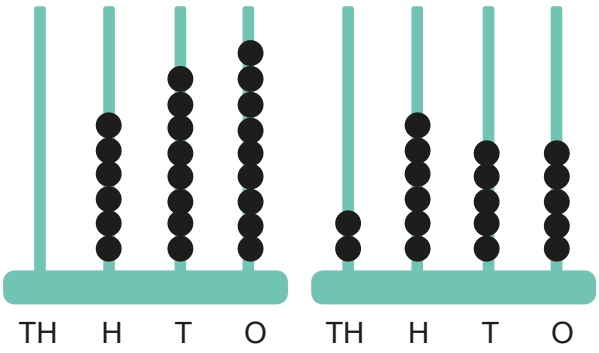
High Ability Learners

- Working in pairs, learners model these numbers 1) 1,608 2) 5,864

- Learners write the values for each digit.
- Assessment for Learners:
- Refer learners to Learner's Book page 43 to 44 for exercise.

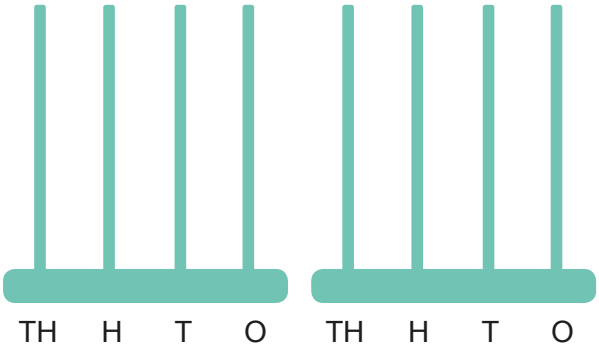
Suggested Home Work

Write the numbers shown on these abacus



Show these numbers on abacus.

1) 668 2) 5,069



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

Module 9: Describing the relationship between numbers up to 10,000

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

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

Learning Expectations
Learners will be able to: describe numbers and the relationship between numbers up to 10,000.

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

New Words
Multi-base block, rod, unit, thousands, hundreds, tens

Resources
Multi-base blocks, number line cards.

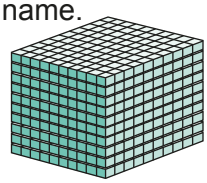
Number of Lessons 2

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

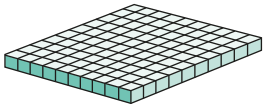
Starter
Play '100 more than'. Call out a number and learners call out another number which is 100 more.
E.g. 200→300 2) 121→22 3) 705→805

Find Out
Have learners work in pairs. Refer learners to Find Out at page 45 of the Learner's Book. They write, read and write the number shown with the base 10 multi-based block.

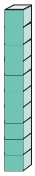
Let us Learn
- Put learners in groups of five. Give out at least 6 each of the multi-based block to learners in their groups. Pick them one by one and learners call out its value and name.



e.g. 1) name is block value 1000



2) name is flat value is 100



2) Name is long value 10

3) name is cube value 1

- Now write some numbers on the board and learners use the multi-based block to model it. 1) 285 2) 5,890 4) 4010
- Learners select a leader in their various group. Then he/she models it. ***(Critical Thinking, Collaborative Learning, Leadership Skills, Attention to Precision)***
- Refer learners to Learner's Book page 45. Learners read and write the values for each model.

Review Exercise

Differentiated Lessons
Low Ability Learners
- Learners work in pairs and model these numbers. 1) 289 2) 3,605

High Ability Learners
- Working in pairs. Learners model these numbers with base 10 multi-based block. 1) 2,605 2) 5,002

Assessment For Learning
Refer learners to Learner's Book page 45 for exercise.

Suggested Home Work
Model these numbers using abacus.
1) 685 2) 889 3) 5,000 4) 4,833

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

Starter

Play '100 more than'. Call out a number, learners call out a number which is 100 more than that number. E.g.
200→300 2) 121→221 3) 705→805

Let Us Learn

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

Review Exercise

Differentiated Lessons
Low Ability Learners

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

High Ability Learners

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

Assessment For Learning

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

Suggested Home Work

Model these numbers.
1) 8654 2) 9899 3) 7890

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

Module 10: Relationship between numbers

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

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

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

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

New Words
Value, digit, placement, position, worth

Resources
Hundred-frame

Number of Lessons 2

Lesson 1 Finding values of digits in a given number.

Starter
Play: "Guess my Number"
E.g. I am a number. I am a multiple of 10. I lie between 40 and 60, who am I?

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

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

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

- Have learners find the values of each digit in 2, 644 in their groups. Learners move round to compare their answers and make corrections where necessary. ***(Critical Thinking, Collaborative Learning, Attention to Precision)***
- Refer learners to page 51 of the Learner's Book. Learners state the value of each digit in 572. Deduce from learners to identify that the

Value of a digit depends upon its placement within a number

Have learners write their own number in pairs and write the value for each digit.

Review Exercise

Differentiated Lessons
Low Ability Learners
What are the values of the underlined digits?
1) 889 2) 5677

High Ability Learners
What are the values of the underlined digits?
1) 5,680 2) 6,666 3) 9,974 4) 9,650

Assessment for Learning
Refer learners to page 53 of the Learner's Book for exercises.

Lesson 2: Reading numbers up to 1,000

Starter

Play: "Making 10s"

Mention a number and learners call out another number which when added to the number mentioned add up to 10.

E.g. 1) 6→4 2) 8→2 3) 7→3

Let Us Learn

- Put learners into groups of five. Write these numbers on the board. Call out some learners to read them.

  1) 685 2) 299 3) 968

  685 → six hundred and eighty-five.

  968 → nine hundred and sixty-eight.
- Learners write their own numerals and read them one after the other. ***(Critical Learning, Critical Thinking, Attention to Precision)***
- Have learner understand that reading numbers depends upon the placement of the digits. In a 3-digit number like 789, the seven is seven hundred, the 8 is eighty and the 9 is nine. This is read as seven hundred and eighty-nine.
- Refer learners to Learner's Book page 37 to 52. Go through the exercise 224 with learners. 224 is read as two hundred and twenty-four.

Review Exercise

Differentiated Lessons

Low Ability Learners

- Have learners read these numbers in pairs.

  1) 432 2) 678 3) 531

High Ability Learners

- Have learners read these numbers in pairs.

  1) 582 2) 789 3) 999 4) 870

Assessment for Learning

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

Suggested Home Work

Write the number names for these numbers and read them.

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

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

Module 11: Decomposing numbers up to 10,000

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

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

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

Essentials For Learning
Learners can decompose 3-digit numbers.

New Words
Decompose, break apart.

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

Number of Lessons 2

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

Starter
Play: "100 more than". Call out a number and learners add 100 to it and call out the number.
E.g. 1) 500→600 2) 658→758 3) 899→999

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

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

168	259	989	678

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

Thousand	Hundred	Tens	Ones
1	6	7	8

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

Thousand	Hundred	Tens	Ones
4	6	4	8
↓	↓	↓	↓
4000	600	4	8

- Refer learners to page 55 of the Learner's Book. Have learners decompose the numbers 349, 4567 in pairs using both the expanded form and the hundreds-frame.

Review Exercise

Differentiated Lessons
Low Ability Learners
- Learners work in pairs. Decompose these numbers. 1) 899 2) 2,344

High Ability Learners
- Work in pairs and decompose these numbers. 1) 4688 2) 3,309

Assessment For Learning
Refer learners to Learner's Book page 56 for exercise.

Suggested Home Work
Decompose these numbers.
1) 658 2) 2,340 3) 4899 4) 5000

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

Starter
Play: "100 more than". Call out a number and learners add 100 to it and call out the number.
E.g. 1) 500→600 2) 658→758 3) 899→999

Let Us Learn
- Put learners into groups of five. Write these numbers for learners to decompose into 2 different ways.
  1) 870 2) 4,685
  870 = 800 + 70 = 400 + 400 + 70
  4,685 = 4,000 + 600 + 80 + 5=
  2000 + 2000 + 600 + 80 + 5
- Learners move round to observe how other groups decomposed the numbers. They justify how they got their answers. ***(Critical Thinking, Collaborative Learning, Justification of Ideas, Attention to Precision)***
- Learners write two numbers between 5000 – 10,000 on their own and decompose them in 2 different ways. Learners may decompose in several ways. Have them compare their answers, correct errors and accept whichever way they decompose only if the answers are correct
- Refer learners to Learner's Book page 55. They decompose the numbers and insert them in the hundreds frame as well.

Review Exercise

Differentiated Lessons
Low Ability Learners
- Decompose these numbers in two different ways. Work in pairs. 1) 4,272 2) 5,664

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

Assessment For Learning
Refer learners to Learner's Book page 57 for exercise.

Suggested Home Work
Decompose these numbers.
1) 5,623 2) 6,806 3) 8,077 4) 9999

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

Module 12: Comparing and ordering numbers (1)

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

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

Learning Expectations
Learners will be able to compare 2 numbers using expressions a lot more, a little smaller.

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

New Words
Compare, order, increase, decrease. a lot smaller, a lot bigger, a little bigger, a little smaler

Resources
Numeral cards, place value chart.

Number of Lessons 2

Lesson 1: Describing the relative size of numbers.

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

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

Let Us Learn
- Put learners into groups of five. Write these numbers on the board and let them describe the relationship between them. 126 and 526.
- Have learners use the place values to determine the difference. Both numbers have numbers at the hundred columns but 500 is a lot bigger than 100. So, 526 is a lot bigger than 126, and 126 is a lot smaller than 526.
- In their groups learners describe the relationship between these numbers 1) 648 and 230 2) 136 and 128. Have learners critically look at the numbers of the hundreds, the tens and the ones columns. Comparing 136 and 128, in the tens columns, the difference is 10 and in the ones columns the difference is just 2. So, 136 is a little bigger than 128 and 128 is a little smaller than 136.
- Have learners write 2 numbers in their groups and use the expressions learnt to describe the numbers. ***(Critical Thinking, Collaborative Learning, Attention to Precision, Problems solving Skills)***
- Refer to learners' book page ___. Learners compare 126, 593, 590 using 1000 numbers at a time. Go through the exercise with learners, asking leading questions.

Review Exercise

Differentiated Lessons
Low Ability Learners
- Work in pairs. Describe these 2 numbers using a lot, bigger/smaller, a little bigger/ smaller. 1) 268 and 248 2) 468 and 742, justify your answers.

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

Assessment for Learning
Refer leaners to Learner's Book page 60 for exercise.

Suggested Home Work
Compare these numbers using the expressions, a lot bigger/smaller, a little bigger/smaller than.
1) 478 and 467 2) 1,286 and 1,255
3) 6,782 and 9, 827

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

Starter

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

E.g. 1) 13 → 23 2) 40 → 50
3) 50 → 60 4) 90 → 100

Let Us Learn

- Put leaners into groups of five. Write these numbers on the board 268 and 320. Have learners find the values of each digit. i.e. looking at the 2 numbers, 300 is greater than 200 so, 320 is greater than 268. Encourage learners to use the symbols. So, 320>268 and 268<320. ***(Critical Thinking, Collaborative Learning, Attention to Precision)***
- In pairs have learners compare these numbers.
- 786 and 868 b) 428 and 426
- Learners write two numbers on their own and compare them using the symbols >, = and <. ***(Critical thinking, Collaborative Learning, attention to Precision)***
- Refer learners to Learner's Book page 59. Go through the exercises 778 and 778 with learners. Have them compare the numbers at the hundreds columns, the tens columns and the ones column and draw the conclusions. 778 = 778

Review exercise

Differentiated Lessons

Low Ability learners

- Compare these numbers, use the symbols >, = and <. Work in pairs.
  1) 428 ___ 482 2) 681 ____ 599

High Ability Learners

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

Assessment for Learning:

Refer leaners to Learner's Book page 61 for exercise.

Suggested Home Work

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

1) 8856 ____ 8856 2) 640 ___ 642
3) 9872 ____ 8972 4) 8456 ___ 8546

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

Module 13: Comparing and ordering whole numbers (2)

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

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

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

Essentials For Learning
Learners can use the symbols >, < and = to compare 2 numbers.

New Words
Order, increasing, decreasing, arrange

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

Number of Lessons 3

Lesson 1: Ordering numbers

Starter
Play: "10 more than". Mention a number and learners add 10 more and call out the number.
E.g. 1) 64 → 74 2) 450 → 460
3) 630 →640 4) 850 → 860

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

60	99	100

98	99	100

(Critical Thinking, Collaborative Learning, Justification of Ideas)

Let us Learn
- Display the thousand number chart on the board. Revise movement from left to right and vice-versa with learners. Numbers increase by 1 when moving from left to right and decrease by 1 when moving from right to left. With movement downwards, the numbers increase by 10 and decrease by 10 when moving upwards.
- Have learners order these numbers in increasing order 160, 170, 180, 190. Have them order in decreasing order as well. 190, 180, 170, 160.
- In pairs, have learners order these numbers both in ascending and descending orders. 238, 283, 452, 524. ***(Critical Thinking, Collaborative Learning, Justification of Ideas)***
- Refer to Learner's Book page 62.
- Go through the 3 frames with learners on question 1, by the rule that learners have identified, ordering in increasing order is 18, 28, 38, 29, 29, 27

Review Exercise

Differentiated Lessons
Low Ability Learners
- Work in pairs. Order these numbers in increasing and decreasing orders. 48, 23, 132, 232

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

Assessment for Learning
Refer leaners to Learner,s Book page 66 for exercise.

Suggested Home Work
Order these numbers in increasing and decreasing orders.
1. 72, 65, 328, 142
2. 1,248, 3,785, 999, 332
3. 38, 99, 20, 142

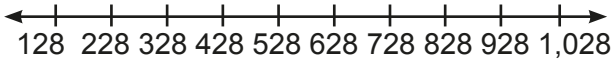
Lesson 2: Ordering numbers using the number line.

Starter

Play: "10 more than". Mention a number and learners add 10 more and call out the number.
E.g. 1) 64 → 74 2) 450 → 460
3) 630 → 640 4) 850 → 860

Let Us Learn

- Write these numbers on numeral cards. 120, 130, 150, 160. Call 4 learners to come and pick the numbers randomly. (2 boys and 2 girls)
- Let them come to the front of the class. They should use the number line as a guide. Ask the class to re-order the learners so that the numbers are in order, from the smallest to the largest and vice-versa. Ask the class to tell you the strategies used when ordering numbers. ***(Critical Thinking, Problems Solving Skills, Attention to Precision)***
  Draw a number line on the board.
  Write these numbers on it



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

Review Exercise

Differentiated Lessons
Low Ability learners

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

High Ability Learners

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

Assessment for Learning

- Refer leaners to Learner's Book page 67 for exercise.

Suggested Home Work

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

Lesson 3: Ordering numbers using place value

Starter

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

Let Us learn

- Put learners into groups of five. Give each group the hundred number chart. Learners insert these numbers in the frame.

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

- Learners in their groups compare the numbers starting from the ten thousand to the ones and identify the largest number and the smallest number. Learner reorder the numbers from decreasing to increasing and vice-versa.

- Refer learners to Learner's Book page 65. Go through the exercises with learners. Have learners discuss, the strategies to be used when ordering numbers. Is ordering numbers different form comparing numbers?
- Give your reasons. ***(Critical Thinking, Problems Solving Skills, Attention to Precision, Collaborative Learning)***

Review Exercise

Differentiated Lessons
Low Ability Learners

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

High Ability Learners

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

Assessment for Learning
Refer learners to exercise 3 on page 68 of the Learner's Book.

Suggested Home Work
Use the hundred-frame to order these numbers from

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

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

Module 14: Comparing and ordering whole numbers (3)

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

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

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

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

Resources
compare, increasing, decreasing, order

Resources
Number line cards, hundred charts.

Number of Lessons 2

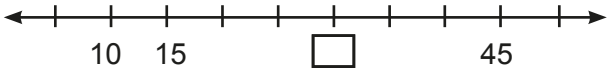
Lesson 1: Finding missing numbers on a number line

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

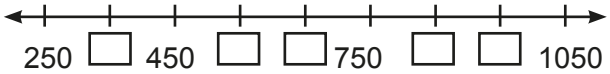
Find Out
Refer learners to Find Out on page 69 of the Learner's Book. Learners work in pairs and fill in the missing numbers. Elicit from learners the rule they have identified when moving upwards and downwards and from left to right and vice-versa. Learners compare their answers with others and justify their answers. (Justification of Ideas, Critical Thinking, Collaborative Learning)
Draw a number line on the board, leave out some numbers, learners work in pairs to complete them. They compare their work with others and correct themselves where there are errors. (Critical thinking, Collaborative Learning, Attention to Precision)
Refer learners to page 69 of the Learner's Book. Go through the exercises with learners. Elicit from learners to identify the intervals first. In exercise 1, the intervals are 5. So, the frog is at 50. In exercise 2 the intervals are 10. So, the frog is at 150. (Critical Thinking, Collaborative Learning, Problems solving Skills)

Review Exercise

Differentiated Lessons
Low Ability Learners
- Work in pairs. Fill in the missing numbers.

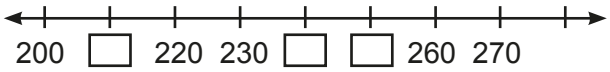


High Ability Learners
- Work in pairs. Fill in the missing numbers.

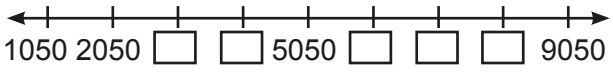


Assessment for Learning
Refer leaners to Learner's Book page 71 for exercise.

Suggested Home Work
Fill in the missing numbers.
1)



2)



Lesson 2: Finding Missing numbers using charts

Starter

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

Let Us Learn

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

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

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

- Refer learners to Learner's Book page 70. Go through the exercise with them. Deduce from learners to come out with the missing numbers they should justify their answers by explaining how they got the answers. ***(Critical Thinking, Collaborative Learning, Justification of Ideas, Problems Solving Skills)***

Review Exercise

Differentiated Lessons

Low Ability Learners

- Work in pairs. Fill in the missing numbers.

40				
70		72		74

High Ability Learners

- Work in pairs. Fill in the missing numbers.

	59			
	90			93

Assessment for Learning

Refer leaners to Learner,s Book page 72 for exercise.

Suggested Home Work

Fill in the missing numbers.

Draw 100-chart and leave out these numbers.

6, 23, 37, 48, 50, 69, 70. 88, 94, 99

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

Module 15: Comparing and ordering whole numbers (4)

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

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

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

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

New Words
Compare, less than, more than.

Resources
Word problem cards, 1000 number chart.

Number of Lessons 1

Lesson 1: Comparing quantities using word problems.

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

Find Out
Refer learners to page 73 of the Learner's Book. Have learners talk about the ages of the 2 learners by comparing. 1) Ask who is older? 2) By how many years?

Let Us Learn
- Have learners answer these questions orally.
  I have 2 pencils; Amina has 5 pencils. Who has more? By how many?
  Teacher Atta has 10 markers; Headteacher has 70. Who has less? By how many?
  A poultry farm collects 600 eggs a day. Another farmer collects 500 a day. Who collects more? By how many? ***(Problems solving Skills, Collaborative Learning, Critical Thinking)***
  Learners in pairs pose similar problems and compare.
- Refer learners to learners' book page 73. Give out the 100-number chart to learners. Learners locate 520 and 310 on the chart to identify the greater number. Deduce from learners how they can answer the question "How many more eggs has Afua than Esi? Learners subtract 310 from 520 to get the answer.

Review Exercise

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

High Ability Learners
- Work in pairs.
- Write 2 sentences on your own and compare the 2 numbers.

Assessment for Learning
Refer leaners to Learner's Book page 74 for exercise.

Suggested Home Work
What can you say about these sentences?
1. Aunty Ama has 8 children. Aunty Aku has 6 children. Who has more?
2. There are 20 balloons in a red box and 35 in a blue bowl, which bowl has less balloons?
3. Write one-word problem and compare the numbers.

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

Module 16: Positive and Negative numbers (1)

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

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

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

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

New Words
Positive, negative, sea level, above, below.

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

Number of Lessons 1

Lesson 1: Positive and negative numbers

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

Let Us Learn
- Ask learners to tell you where these objects could be found. Fish, ship, whale. Expected answers, they could be found in the sea. Ask learners to tell you objects which could be found above the sea. E.g. cars, human beings, goats.
- Explain to learners that some objects could be found above the sea. Encourage them to say "above sea level" and "below sea level". Have learners give examples of objects that could be found "above sea level" and those that could be found "below sea level". (Critical Thinking, Collaborative Learning, Attention to Precision, Justification of Ideas)

1. Refer learners to learners' book page 75. Have learners study the picture and mention the objects that are found below the sea. E.g. shells, whale, fish. Learners mention objects that are found above the sea level. E.g. birds, boat, trees, airplane. Make them aware that,
2. Objects found on land are: "above sea level" e.g. birds, trees, houses, cars.
3. Objects found in the sea are: "at sea level" e.g. ship, boat.
4. Objects found below the sea are: "below sea level" e.g. fish, whale. ***(Critical Thinking, Collaborative Learning, Attention to Precision)***

- Refer learners to learners' book page 75. Let learners understand that object like ship and boat which are at sea level is represented by zero (0). Below sea levels are taking as negative numbers (-) above sea levels are taking as positive (+) numbers.
  Have learners give you practical examples. E.g. owing somebody money → negative (-). Having your own money → positive (+)

Review Exercises

Differentiated Lessons
Low Ability Learners
Whole class
1. Learners answer whether the statement is positive or negative.
2. Borrowing a pencil from a friend ___ - ve
3. Borrowing an eraser from a shop. ___ -ve
4. Having 3 toffees in your bag. _____ +ve
5. Having GHC 10.00 in your pocket ___ +ve

Assessment for Learning
Refer leaners to Learners Book page 77 for exercise.

Suggested Home Work
Write positive or negative beside these statements,
1. Mumani has 6 oranges.
2. Seiwah collected an eraser from a friend.
3. I have GHC 50.00 in my money box.
4. Ata collected cutlass from Musa.
5. Teacher Kwesi has 2 cars.

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

Module 17: Describing situations using positive and negative values

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

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

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

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

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

Resources
Thermometer, ice blocks, electric kettle.

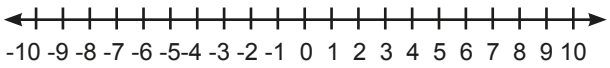
Number of Lessons 1

Lesson 1: Positive and negative numbers (2)

Starter
Play: "2 more than". Mention a number and learners add 2 to it and call out the number.
E.g. 1) 4 → 6 2) 8 → 10 3) 32 → 34

Find Out
Refer to page 78 of the Learner's Book. Learners mention the names of the items there and how they are got. E.g. ice blocks are got when the freezing point is below 0°C and water boils at 100°C.
Boil water in a kettle. When it boils, ask what is the boiling point?

Let Us Learn
- Call out a boy and a girl to the front of the class. Let the girl walk towards you. Ask the boy to turn back and walk towards you. Let the class discuss the two ways that they walked.
- Draw a number line on the Floor with zero and some negative numbers.
- Call 2 learners to stand on the number line at 0 with their backs facing each other. The learners move on the opposite direction on the number line and call out the numbers as they step on.

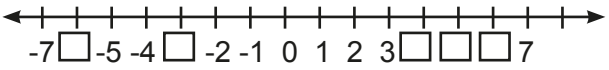


- Repeat this activity several times with different learners. ***(Critical thinking, Problems Solving Skills, Collaborative Learning, Attention to Precision)***
- Review Exercise. Work in groups of four. They draw number line to include 10 and + 10. They hop on it one after the other while the rest call out the numbers.
- Refer learners to Let us Learn: on page 78 of the Learner's Book. Go through the activities practically with learners

Assessment for Learning
Refer leaners to Learner's Book page 80 for exercise.

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

Fill in the missing gaps.



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

Module 18: Count forwards and backwards

Content Standard
B3.1.1.3: Identify negative numbers up to -10

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

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

Essentials For Learning
Learners can write positive and negative numbers on the number line and can hop on it.

New Words
Forwards, backwards, positive, negative.

Resources
Number line cards, positive and negative number line cards.

Number of Lessons 2

Lesson 1: Counting forwards through zero (0).

Starter
Play:"1 more than". Mention a number and learners add 1 to it and call out the number
e.g. 1) 6 →7 2) 15 → 16 3) 30 → 31 4) 88 → 89

Find Out
Have learners work in pairs. Refer learners to page 81 of the Learner's Book. Ask these questions:
How are you going to work these questions?
Which strategy will you use up?
Deduce from learners to come out to use counting up and counting back strategy to solve the questions. (Critical Thinking, Collaboration Learning, Problems Solving Skills)

Let Us Learn
- Learners make a big circle outside / inside the classroom. Draw a number line with +ve and –ve numbers in the middle of the circle. Call out a number and learners hop from 0 to that number. Have more learners take part.
  1) 6 2) 4 3) 8 4) 10 5) 0
  (Collaborative Learning, Critical Thinking, Attention to Precision)
- Now ask a learner to stand on – 3 ask him/her to move 4 steps forwards. The rest tells the number that he/she will land. He/she will be on +ve 1. Repeat this activity with different numbers and different learners. ***(Critical Thinking, Collaborative Learning, Attention to Precision)***
- Refer learners to Learner's Book page 81. Go through exercise a and b with learners. learners. They practice on their own.

Review Exercise

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

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

Assessment for Learning
Refer leaners to Learner's Book page 83 for exercise.

Suggested Home Work
Use number line cards to help you find answers to these questions.
1) -2 + 5 = ? 2) 0 + 6 = ? 3) -5 + 7 = ?
4) 10 + 12 = ?

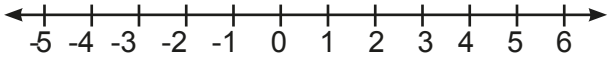
Lesson 2: Counting backwards through zero (0)

Starter

Play:"1 more than". Mention a number and learners add 1 to it and call out the number
e.g. 1) 6 → 7 2) 15 → 16 3) 30 → 31
4) 88 → 89

Let Us Learn

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



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

4 – 6 = ?	6 – 10 = ?

(Critical Thinking, Collaborative Learning, Attention to Precision)

- Refer learners to Learner's Book page 82. Go through the exercises with learners question b, the sentence becomes 2 – 5 = ?

Review Exercise

Differentiated Lessons
Low Ability Learners

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

3 – 6 = ?	2) 6 – 8 = ?

High Ability Learners

- Work in pairs. You may use the number line.

1) 6 – 8 = ?	2) 12 – 13 = ?	3) 9 – 14 = ?

Assessment for Learning

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

Suggested Home Work

Solve these questions.

1) 5 + 7 = ?	2) 9 – 9 = ?
3) 4 – 12 = ?	4) 2 – 8 = ?

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

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

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

Module 1: Addition and subtraction facts (fluency 1)

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

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

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

Essentials for Learning
Learners can do addition and subtraction using counting up/down, friendly, jumps strategies.

New Words
Unknown, partition, solve, counton, count down, decompose, subtract.

Resources
Number line cards, bottle caps, bowls, pebbles.

Number of Lessons 2

Lesson 1: Finding unknown in addition sentence

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

Find Out
Have learners work in pairs
Ask: "How do you find the unknown in the picture? Explain the strategy you will use to your partner. Refer learners to page 88 of the Learner's Book.

Let Us Learn
- Put three bowls on your table, count 10 bottle caps with learners and put them in the first bowl. Count another 30 bottle caps and put them in the third bowl.
- Ask: "How many bottle caps should I put in the second bowl so that when I add the numbers in the first and second bowls, the sum will be 30 as in the third bowl.
  18 + ☐ = 30
- Learners brainstorm in their groups to find the solution. The question could be written as 10 + what = 30. Now, the "what" is the unknown which we are representing it with or ☐ __ ***(problem solving skills, critical thinking, collaborative learning)***
- Learners in their groups repeat the activity several times with different numbers. Give the bottle caps and bowls to learners. They repeat activity one in their groups. They create their own word problems and solve them.
- Refer learners to Learners Book page 88. Learners in their group write the addition sentence as
- 20 + ☐ = 35 and solve it. Go through the other questions with learners. Ask the following questions to text learners understanding.
- What symbol do we use for unknown?
- When do we use the unknown symbol?

Review Exercise

Differentiated lessons
Low Ability Learners
- Find the unknown in these statements to make the sentences true.

  1) 60 + ☐ = 100 2) 145 + ☐ = 245

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

Assessment for Learning
Refer leaners to Learner's Book page 91 for exercise.

Suggested Home Work
Find the unknown numbers in these sentences.

1) 320 + ☐ = 840 2) 600 + ☐ = 1000

3) 410 + ☐ = 485

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

Lesson 2: Finding unknown in subtraction sentences.

Starter

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

Let Us Learn

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

  1) 60 + ☐ = 120 2) 222 + ☐ = 272
- Have learners compare their work and the strategies they used to find the unknown ***(critical thinking, collaborative learning, personal development).***
- Refer learners to Learner's Book page 90. Go through Let us Learn: 2 with learners. 373 − ☐ = 325. Deduce from learners what strategy they will use to get the answer.

Review Exercise

Differentiated Lessons

Ask:

What symbol do we use for the unknown?

Why?

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

Low Ability Learners

- Work in pairs to solve these subtraction sentences. 1) 68 − ☐ = 13

  2) 246 − ☐ = 46

High Ability Learners

- Work in pairs to solve these subtraction sentences. 1) 268 − ☐ = 132

  2) 350 − ☐ = 125

Assessment for Learning: Refer leaners to Learner's Book page 91 for exercise.

Suggested Home Work

1) 79 - ☐ = 30 2) 298 - ☐ = 123

3) 652 - ☐ = 320

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

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

Module 2: Addition and subtraction facts (fluency 2)

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

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

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

Essentials for Learning
Learners can solve addition and subtraction sentences within 100.

New Words
Decompose.

Resources
Numeral cards, number line cards.

Number of Lessons 2

Lesson 1: Addition (using decomposition strategy).

Starter
Play: "100 more than". Call out a number and learners add 100 to it and call out the number.
E.g. 1) 50 → 150 2) 306 → 460
3) 700 → 800

Find Out
Refer learners to page 92 of the Learner's Book.
Have learners work in pairs. Ask:
Can you easily add 7 and 3? Why?
Can you easily add 7 and 2? Why?
Of the two which is more easier?
Elicit from learners why they can add 7 and 3 easily but cannot add 7 and 2 easily (problem solving skills, critical thinking, collaborative learning).

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

1) 165 + 233
165
↓
100 + 60 + 5

2) 504 + 336
233
↓
200 + 30 + 3

100 + 200 = 300
60 + 30 = 90
5 + 3 = 8
300 + 90 + 8 = 398

- Refer learners to Learner's Book page 92. Go through 'Let Us Learn 1" questions with learners.

Review Exercise
Ask:
How do you decompose 3-digit numbers?
How do you decompose 2-digit numbers?

Differentiated Lessons
Low Ability Learners
- Work in pairs. Solve these addition sentences. 1) 62 + 27 = ☐
  2) 436 + 264 = ☐

High Ability Learners
- Work in pairs. 1) 128 +282
  2) 436 + 264

Assessment for Learning
Refer leaners to Learner's Book page 95 for exercise.

Suggested Home Work
Use decomposition strategy to solve these addition sentences.
1) 644 +166 2) 464 + 125
3) 482 + 333 4) 672 + 352

Lesson 2: Addition (using friendly jump strategy).

Starter

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

Let Us Learn

- Explain to learners that they can decompose the 2 numbers and subtract or decompose the (subtrahend) second number and use friendly jumps to subtract. Have learners decompose 225 as 200 + 20 + 5 and 346 as 300 + 40 + 6.
  300 – 200 = 100
  40 – 20 = 20 or 346
  6 – 5 = 1
  So 346 – 225 = 121
- Learners compare and discuss the strategy they used to get their answer. They write one subtraction sentence in pairs and solve it ***(critical thinking, problem solving skills, attention to precision).***
- Refer learners to Learner's Book page 93. Go through the question with learners.

Review Exercise

Differentiated lessons
Low Ability Learners

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

High Ability Learners

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

Assessment for Learning

Refer leaners to Learner's Book page 96 for exercise.

Suggested Home Work

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

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

Module 3: Addition & subtraction

Constant Standard
B3.1.2.2: Demonstrate an understanding of the concept of "equality" and "not equal to" in addition and subtraction problems with sums up to 1000.

Indicator
B3.1.2.2.1: Use the concept of "equal to" and "not equal to"

Learning Expectation
Learners will be able to use the concept of "equal to" and "not equal to" to make addition and subtraction sentences true.

Essentials for Learning
Learners can compare numbers, using the symbols <, > and =.

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

Number of Lessons 2

Lesson 1: Using the symbols = and ≠ to make sentences true (1).

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

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

Ask:
What can you say about scale AD?
What can you say about scale CD?

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

Let Us Learn
- Put learners into groups of five. Give each group 20 bottle caps and the 2 symbols cards. Learners divide them into 2 equal parts. Ask learners to tell you how many are in each set (critical thinking, collaborative learning, attention to precision).
- Now ask learners to put them into 2 unequal groupings. E.g. 15 and 5, 8 ant 12, 7 and 13. Learners will have different groupings. Ask learners to describe the 2 groupings that they have made.
- Expected answers: they are not the same, they are not equal. Introduce the symbol for not equal symbols to them '≠'. Ask them to pick it and place it in the 2 groupings that they have made. ***(critical thinking, collaborative learning, leadership skills)***
- Have learners repeat the same activity with 30 bottle caps. They should use the '≠' to compare.
- Refer learners to Learner's Book page 97 to 98. Go through question 1 and 2 with learners. Have them compare the number of bottle caps and the caps and draw conclusion.
  Ask:
- When do we use equal to sign?
- When do we use not equal to sign?

Review Exercise

Differentiated Lessons
Learners work in pairs. Give out 22 straws to each group. They make 3 unequal groupings of the 22 straws.

Assessment for Learning: Refer leaners to Learner's Book page 100 for exercise.

Suggested Home Work
Make 3 unequal groupings of 20 bottle caps by drawing.

Lesson 2: Using the symbols = and ≠ to make sentences true (2).

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

Let Us Learn
- Put learners into groups of five. Write this sentence on the board.
- 1) 50 ____ 30 + 20 2) 120 _____ 80 + 70. Elicit from learners the appropriate symbol to insert to make the statements true. For question 1 learners add 30 to 20 which is 50. So, 50 = 50. For question 2 80 + 70 = 150 so 120 ≠ 150 ***(critical thinking, collaborative learning, attention to precision).***
- Write 35 on the board. in pairs learners write 3 statements which are not equal to 35.
- Refer learners to page 99. Go through the activities with learners.

Review Exercise

Ask:
When do we use the symbol = ?
When do we use the symbol ≠ ?

Differentiated lessons
Low Ability Learners
- Work in pairs. Write 2 unequal statement with the number 30.

High Ability Learners
- Work in pairs. Write 3 unequal statement with the number 95.

Assessment for Learning: Refer leaners to Learner's Book page 101 for exercise.

Suggested Home Work
Insert the symbol = and ≠ to make the statements true.
120 _____ 80 + 40
120 _____ 100 + 30
45 + 40 ____ 100
245 _____ 200 + 50

For additional exercises on this module, refer to pages 66 - 68 of the Workbook

Module 4: Relationship between addition and subtraction

Content Standard
B3.1.2.2: Demonstrate an understanding of the concept of "equality" and "not equal to" in addition and subtraction problems with sums up to 1000.

Indicator
B3.1.2.2.1: Use the concept of "equal to" and "not equal to"

Learning Expectation
Learners will be able to describe a subtraction as an equivalent addition and vice-versa.

Essentials for Learning
Learners can solve addition and subtraction sentence within 1000.

New Words
Equivalent, relationship.

Resources
Numeral cards, bottle caps.

Number of Lessons 2

Lesson 1: Changing Addition sentence into Subtraction sentence.

Starter
Play: "Adding 10 more". Mention a number and learners add 10 to it and call out the number.
E.g. 1) 25 → 35 2) 70 → 80 3) 85 → 95

Find Out
Refer learners to page 102 of the Learner's Book. Ask learners to pick 2 numbers which when added or subtracted give an answer 22. Expected answer are 10+12 and 36-24 = 22. Elicit from learners how they got the answers (problem solving skills, critical learning, collaborative learning)

Let Us Learn

- Put learners into groups of five. Give them numeral cards. Learners decompose them and write sentences which describe the relationship between addition and subtraction.

e.g. 24 → 10+14 → 10 + 14 = 24
14 + 10 =24
24 − 10 = 14
24 − 14 = 10 These describe the relationship between addition and subtraction.

.

- Write 38 + ☐ = 60. This could be re-written as 60 − 38 = ☐. Let learners decompose the numbers and solve it

60 − 38
↓ ↓
30 + 30 30 + 8
30 + 30 - 30
30 − 8 = 22 ***(critical thinking, collaborative learning, attention to precision)***

- Refer learners to Learner's Book page 102 to 103. 'Let us Learn 1'. Go through the 2 questions with learners. 1) 16 + ☐ = 28
2) 49 + ☐ = 84. Learners change it to 84 − 49 = ☐. Use decomposition strategy and solve it.
b) 345 + ☐ = 562 becomes 562 − 345 = ☐
- Ask learners: Can you change addition sentence into subtraction sentence? How do you go about it?

Review Exercise

Differentiated lessons
Low Ability Learners

- Work in pairs. Change these addition sentences into subtraction sentences and solve them.
45 + ☐ = 60 2) 135 + ☐ = 140

High Ability Learners

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

132 + ☐ = 164 2) 84 + ☐ = 120

Assessment for Learning

Refer leaners to Learners' Book page 105 for exercise.

Suggested Home Work

Change the addition sentences into subtraction sentences and solve them.

1) 56+☐ = 99 2) 210+☐ = 450

3) 80+☐=120

4) 123+☐ = 276

Lesson 2:

Starter

Play: "Adding 10 more". Mention a number and learners add 10 to it and call out the number.
E.g. 1) 25 → 35 2) 70 → 80 3) 85 → 95

Let Us Learn

- Put learners into groups of five. Write this sentence on the board and ask learners to explain the meaning. 65 – 33 = 32. This means 65 − 33 = 32 which is the same as 33 + 32 = 65
- Let learners change this to addition sentence and solve it 52 − ☐ = 25. This is the same as 25 + ☐ = 52
  → 52 − 25 = ☐.
- Learners use any addition strategy to solve the question.
  Have learners write their own subtraction sentences and solve them ***(problem solving kills, collaborative learning, critical thinking)***
- Refer learners toLet us Learn: 2 on Learner's Book 104. Go through the questions with them.

Review Exercises

Differentiated lessons

Low Ability Learners

- Solve these questions. 1) 75 − ☐ = 30
  2) 39 − ☐ = 20

High Ability Learners

- Work in pairs. Solve these subtraction problems.

1) 73 −☐= 60 2) 58 −☐ = 50

3) 250 − 150 = 100 4)96 −☐= 25

- Refer learners to exercise 2 on page 105 of the Learner's Book

Suggested Home Work

Solve these questions.

1) 82 −☐= 62 2) 100 − 40 = ☐

3) 90 −☐= 68 4) 70 −☐ = 65

For additional exercises on this module, refer to pages 69 - 70 of the Workbook

Module 5: Addition strategies (1)

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

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

Learners Expectations
Learners will be able to demonstrate mastery of addition facts up to 18.

Essentials for Learning
Learners can do addition with sum up to 1000.

New Words
Count back, subtract, minued, subtrahend

Resources
Numeral cards, bottle caps, straws.
Lesson 1: Making Addition Facts.

Number of Lessons 1

Lesson 1: Making addition Facts

Starter
Play: "Making Doubles'. Call out a number and learners double it.
E.g. 1) 10 → 20 2) 4 → 8 3) 20 → 40
4) 50 → 100

Find Out
Have learners work in pairs. Refer learners to page 106 of the Learner's Book. Ask learners how they could find the missing number with the sum and one of the numbers given. Expected answer is 8. Learners discuss among themselves how they got the answer.

Let Us learn
- Put learners into groups of five.
  Demonstrate how a fact family could be got given 3 numbers.
  Given 8, 12 and 8,
  12 + 8 = 20
  8 + 12 = 20
  20 − 12 = 8
  20 – 8 = 12

Write these on the board for learners to write the fact family for
3, 9 and 12
3 + 9 = 12
9 + 3 = 12
12 – 3 = 9
12 – 9 = 3
Have learners compare their answers with other groups and correct themselves.
Refer to Learner's Book page 106. In pairs, learners find the fact family for the numbers. 12, 10 and 2.

Review Exercise
Low ability Learners
Find the fact family for those numbers 6, 4 and 10

High ability Learners
Given the fact family, find the addition sum.

a) 6 + 4 = ☐ b) 4 + 6 = ☐
c) 10 – 4 = ☐ d) 10 – 6 = 4

Assessment for Learning
Refer learners to Learner's Book page 107 for exercise.

Suggested Home Work
Given the fact family, solve these sentences.
9, 8 and 17

1 9, 8 and 17
a) 9 + 8 = ☐
b) 8 + 9 = ☐
c) 17 – 9 = ☐
d) 17 – ☐ = 9

2 12, 8 and 20
a) 12 + 8 = ☐
b) 8 + ☐ = 20
c) 20 – ☐ = 12
d) 20 – 12 = ☐

For additional exercises on this module, refer to pages 71 - 73 of the Workbook

Module 6: Addition strategies (2)

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

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

Learning Expectations
Learners will be able to use 'Making Doubles Strategy' to find addition sum.

Essentials for Learners
Learners can solve addition problems with sum up to 100.

New Words
Double, move part, decompose.

Resources
Objects which are in doubles. E.g. spectacles, shoes, feet.

Number of Lessons 2

Lesson 1: Making double to do Addition II.

Starter
Play: "Making Doubles'. Mention a number and learners multiply the number by 2 and call out the number. 1) 3 → 6 2) 6 → 12
3) 10 → 20 4) 20 → 40

Find Out
Refer learners to 'Find Out' on page 108 of the Learner's Book. Learners working in pairs talk about what is in the picture. Deduce from learners the total number of toes there. How many are on each foot? What is the total (critical thinking, collaborative learning, attention to precision).

Let Us Learn
- Call out different numbers and learners write down their doubles. E.g. 1 = 2, 4 = 8, 9 = 18, 10 = 20.
- Write these sentences on the board. Elicit from them whether they can make double of any of the numbers for easy addition. Learners have to decompose one of the numbers. 20+28. Decompose 28 as 20 + 8 to get double of 20. The sentence now reads 20 + 20 + 8, 40 + 8 = 48 ***(critical thinking, collaborative learning)***
- Write these on the board for learners to use Making doubles to add.
- They should work in pairs. 1) 30 + 39 = ? 2) 25 + 15 = ? Learners compare their answers with others, make corrections where necessary ***(critical thinking, collaborative learning, leadership skills).***
- Refer learners to 'Let us Learn: 1 of the Learner's Book page 108 . Go through exercise 1 and 2 with learners. Learners have to decompose 18 as 16 + 2, to get doubles for 16, then 38 as 32 + 6 to get double of 32.

Review Exercise
Ask the following questions.
How do you get a double of a number?
What strategy do you use to get a double?

Differentiated Lessons
Low Ability Learners
- Work in pairs. Solve these. Use making doubles.
  1) 10 + 18 = ? 2) 29 + 20 = ?

High Ability Learners
1) 38 + 33 = ? 2) 75 + 50 = ?

Assessment for Learning
Refer leaners to Learner's Book page 108 for exercise.

Suggested Home Work
Use doubles to solve these addition sentences.
1) 50 + 60 = ? 2) 22 + 18 = ?
3) 40 + 30 = ? 4) 68 + 50 = ?

Lesson 2: "Making doubles for Addition II

Starter
Play: "Making Doubles'. Mention a number and learners multiply the number by 2 and call out the number. 1) 3 → 6 2) 6 → 12 3) 10 → 20 4) 20 → 40

Let Us Learn
- Put learners into groups of five. Write this on the board. Ask learners to discuss how to get doubles from it. 21 + 23 = ? → 22 + 22 (move 1 from 23 and add it to 21 to get 22 + 22 = 44)
- Let learners practice these.
  1) 19 + 21 = ? 2) 29 + 30 = ?
  (critical thinking, collaborative learning, leadership skills)
- Refer learners to 'Let us Learn 2: on page 109 of the Learner's Book. Go through questions 1 and 2 with learners. 36+38=? Elicit from learners how they can make doubles from that question. Learners have to decompose 38 as 37 + 1 so the question now reads 37 + 37 = 74 so 36 + 38 = 74.

Review Exercise

Differentiated Lessons
Work in pairs. Use making doubles Strategy to solve these addition sentences.

Low Ability Learners
1) 19 + 21 = ? 2) 14 + 16 = ?

High Ability Learners
1) 22 + 24 = ? 2) 49 + 51 = ?

Assessment for Learning
Refer leaners to Learner's Book page 110 for exercise 2.

Suggested Home Work
Solve these addition sentences. Use making doubles.
1) 15 + 18 = ? 2) 35 + 31 = ?
3) 28 + 21 = ? 4) 32 + 22 = ?

For additional exercises on this module, refer to pages 74 - 77 of the Workbook

Module 7: Addition Strategies (3)

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

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

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

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

New Words
Decompose, doubles, move part.

Resources
Numeral cards, number line cards.

Number of Lessons 3

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

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

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

Let Us Learn
- Have learners work in groups of five. Write this sentence on the board. 18 + 27 = ? Elicit from learners how they can make one of the two numbers multiples of 10s. 18 + 27 = ?
- Learners discuss which of the two numbers to use. Learners move 2 from 27 and add to 18 to make 20. So, 18 + 27 now reads 20 + 25 = 45 or learners move 3 from 18 and add it to 27 to make 30. So, the question will read 15 + 30 = 45 so, 18 + 27 = 45.
- Have learners practice these in pairs.
  1) 37 + 43 = ? 2) 28 + 47 = ? ***(critical thinking, collaborative learning, problem solving skills)***
- Refer learners to Learner's Book Let us Learn' page 111. 38 + 29 = ? Deduce from learners which of the numbers they will make it a multiple of 10 and why? Learners work in two different ways making first 29, multiple of 10 and then 38, multiples of 10.
- Ask learners the following questions.
- Why do you have to make one of the numbers multiple of 10s?
- How do you make a number a multiple of 10?

Review Exercise

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

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

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

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

Lesson 2: Addition (using 4 decomposition)

Starter
Play: "Making Doubles'. Mention a number and learners multiply the number by 2 and call out the number. 1) 3 → 6 2) 6 → 12
3) 10 →20 4) 20 → 40

Let Us Learn

- Put learners into groups of five. Write this addition sentence on the board 33 + 26 = ? Have learners decompose the second number as 10 + 10 + 6. Learners add starting from the first number 33 and make jumps to get the answer.
- Have learners go over the steps. Write this for learners to solve. 1) 52 + 35
  2) 66+ 22 = ? ***(critical thinking, collaborative learning, attention to precision)***
- Refer learners toLet us Learn: 2 on Learner's Book page 112. Go through the activities with learners.

Review Exercise

Differentiated Lesson

Low Ability Learners
Work in pairs. Solve these
1) 22 + 35 = ? 2) 18 + 21 = ?

High Ability Learners
1) 47 + 36 = ? 2) 39 + 55 = ?

Assessment for Learning
Refer leaners to exercise 2 on Learner's Book page 144.

Suggested Home Work
Decompose one number card, solve these addition sentences.
1) 57 + 28 = ? 2) 35 + 31 = ?
3) 42 + 36 = ? 4) 60 + 35 = ?

Lesson 3: Addition (adding 10s column first)

Starter
Play: "Making Doubles'. Mention a number and learners multiply the number by 2 and call out the number. 1) 3 → 6 2) 6 → 12
3) 10 → 20 4) 20 → 40

Let Us Learn

- Have learners work in groups of five. Write this on the board. 26 + 34 = ? Ask learners to break the numbers into 10s and ones. Add the tens first before the ones. E.g.

  26 + 34
  ↓ ↓
  20 + 6 30 + 4
  20 + 30 6 + 4
  50 + 10 = 60

- Give more examples for learners to work in groups and in pairs. E.g.
  1) 26 + 21 = ? 2) 32 + 47 = ?
  3) 24 + 13 = ? (***critical thinking, collaborative learning, attention to precision)***
- Refer learners to Let us Learn 3: on the Learner's Book page 112. Go through the exercises with learners.

Questions:
How do you add from left to right? Discuss with your partner.

Review Exercise
Solve these addition sentences.

Differentiated Lessons
Low Ability Learners
1) 23 + 32 2) 44 + 36

High Ability Learners
1) 45 + 33 = ? 2) 56 + 28 = ?

Assessment for Learning
Refer leaners to exercise 3 on the Learners' Book page 144.

Suggested Home Work
Work these addition sentences from left to right. 1) 23 + 35 = ? 2) 57 + 22 = ?

3) 44 + 24 = ? 4) 60 + 17 = ?

For additional exercises on this module, refer to pages 78 - 81 of the Workbook

Module 8: Subtraction strategies (1)

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

Indicator
B3.1.2.3.2: Use strategies to mentally add and subtract whole numbers within 100

Learning Expectation
Learners will be able to use a variety of strategies to solve subtraction problems.

Essentials for Learning
Learners can solve subtraction sentences of two numbers within 100.

New Words
Decompose, double, component

Resources
Number line cards, straws.

Number of Lessons 3

Lesson 1: Subtraction (using doubles)

Starter
Play: "10 less than". Mention a number and learners subtract 10 from it. E.g.
1) 30→ 20 2) 15 → 5 3) 37 → 27
4) 100 → 90

Find Out
Refer learners to 'Find Out' on page 115 of the Learner's Book. Learners look at the pictures and talk about it. Ask questions for learners to know that the legs of the animals are in doubles. The goat has four legs → double of 2 is 4. The spider has 8 legs → double of 4 is 8.

Let Us Learn
- Have learners work in pairs. They face each other and look at each other. Learners mention parts of the body which are in pairs. E.g. eyes, legs, feet, fingers toe etc. Learners say other objects which have doubles. E.g. cars (critical thinking, collaborative learning).
- Learners work in groups of five. Write these sentences on the board.
  22 – 11 = ? Now they can easily make doubles from 22. as 11 + 11 = 22. Learners can easily do the subtraction now.
  22 – 11 → 11 + 11 – 11 = 11
- Write these for learners to work in groups of four. 1) 48 – 24 = ? 2) 30 – 15 = ? ***(critical thinking, collaborative learning, attention to precision)***
-
- Refer learners to Let us Learn 1: on the Learner's Book page 115.
- Go through the exercises with learners.

Review Exercise
Ask: How do we make doubles to do subtraction?
Use doubles to subtract. Work in pairs.

Differentiated lessons
Low Ability Learners
1) 20 − 10 = ? 2) 24 − 12 = ?

High Ability Learners
1) 66 − 33 = ? 2) 88 − 44 = ?

Assessment for Learning
Refer learners to exercise 1 of the Learner's Book page 117.

Suggested Home Work
Use doubles to subtract.
1) 24 – 12 = ? 2) 30 – 15 = ?
3) 26 – 13 = ? 4) 70 – 35 = ?

Lesson 2: Subtraction (using decomposition).

Starter
Play: "10 less than". Mention a number and learners subtract 10 from it. E.g.
1) 30 → 20 2) 15 → 5 3) 37 → 27
4) 120 → 110

Let Us Learn
Put learners into groups of five. Write this sentence on the board for learners to solve.
24 − 15 = ?
Learners find doubles which will make 24 and that is 12 + 12. Learners now decompose 15 as 12 + 3 as 12 + 12. The sentence now reads. (12 + 12) – (12 + 3)
12 + 12 − 12 = 12
12 − 3 = 9 so 24 − 15 = 9
Write this for learners to work in pairs.
1) 36 − 21 = ? 2) 44 − 25 = ?
Refer learners to page 116 of the Learner's Book. Take learners through the exercises.

Review Exercise
Work in pairs. Use doubles to solve these subtraction sentences.

Differentiated lessons

Low Ability Learners
1) 22 − 14 = ? 2) 26 − 15 = ?

High Ability Learners
1) 88 − 46 = ? 2) 64 − 37 = ?

Assessment for Learning
Refer leaners to exercise 2 on theLearner's Book page 117.

Suggested Home Work
Solve these subtraction sentences.
1) 40 − 23 = ? 2) 32 − 19 = ?
3) 70 − 38 = ? 4) 50 − 25 = ?

Lesson 3: Subtraction (using compensation strategy).

Starter
Play: "10 less than". Mention a number and learners subtract 10 from it. E.g.
1) 30 → 20 2) 15 → 5
3) 37 → 27 4) 200 → 190

Let Us Learn
- Learners work in groups of five to solve this. 50 − 25 = ? Let learners come to the board to explain the strategies used in solving the problem.
- Now explain step by step how they can use the doubles and the compensation strategies to solve it. 80 − 39 = ?
- Have learners make doubles for
  80 = 40 + 40
  40 + 40 − 40 = 40
  40 − 5 = 35
  40 + 40 − 39 = ? Compensate 39 with 1 to make 40.
- So, 80 − 39 now reads 40 + 40 − 40 = 40 + 1 =.41
- We have to add 1 more to the answer because we subtracted 1 more than was expected. So 80 − 39 = 41.
- Have learners solve this in their groups 60 − 32 = ? ***(critical thinking, problem solving skills, collaborative learning)***
- Refer learners to Learner's Book page 116. Go through the exercises with learners.

Review Exercise
How do you use doubles and compensation strategy to solve subtraction sentence? Give examples.

Differentiated lessons
Solve these subtraction sentences using compensation strategy.

Low Ability Learners
1) 40 − 18 = ? 2) 60 − 27 = ?

High Ability Learners
1) 100 − 58 = ? 2) 120 − 67 = ?

Assessment for Learning
Refer learners to Learner,s Book page 118 for exercises.

Suggested Home Work
Solve these subtraction sentences use doubles and compensation strategies.
1) 80 − 39 = ? 2) 62 − 18 = ?
3) 38 − 17 = ? 4) 100 − 48 = ?

For additional exercises on this module, refer to pages 82 - 86 of the Workbook

Module 9: Subtraction strategies (2)

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

Indicator
B3.1.2.3.2: Use strategies to mentally add and subtract whole numbers within 100

Learning Expectation
Learners will be able to use friendly jumps and compensation strategies to solve subtraction problems.

Essentials for Learning
Learners can use doubles and decomposition strategies to solve subtraction problems.

New Words
Counting up, friendly jumps. compensate, substract

Resources
Number line cards, subtraction sentence cards.

Number of Lessons 2

Lesson 1: Subtraction using compensation

Starter
Play; "Making 10s". Call out a number and learners top up the number to make 10. E.g.
1) 1→ 9 2) 9 → 1
3) 0 → 10 4) 10→0

Find Out
Learners work in pairs. Refer learners to "Find Out" on page 119 of the Learner's Book. Learners work and explain how they got their answers. The strategies used etc. Accept any strategy used if the answer is correct.

Let Us Learn
- Put learners into groups of five. Give out subtraction sentence cards to learners in their groups.

  49 − 28 = ?
- Explain to learners that it is easier to subtract if the subtrahend is in multiples of 10s. They should come out with the number which when added to 28 makes a multiple of 10s. ie 2. So, the subtraction sentence now reads

  49 − 30 (add 2)
  49 − 30 =19
  19 (add 2 more because we subtracted 2 more than was expected 21)
  So 49 − 28 = 21
- Have learners work in pairs and solve these.
  1) 77− 39 = ? 2) 69 − 27 = ?
- Refer learners to Let us Learn: 1 on the Learner's Book page 119. Go through the questions with learners. Invite a group to come and solve it on the board ***(critical thinking, collaborative learning, leadership skills, attention to precision).***
- How will you use compensation strategy to solve this? 49-18=?
- Refer learners to page 120 of the Learner's Book. Go through the exercise with them.

Review Exercise
Use compensation strategy to solve these subtraction sentences.

Differentiated lessons
Low Ability Learners
1) 36 − 19 = ? 2) 58 − 39 = ?

High Ability Learners
1) 88 − 48 = ? 2) 98 − 67 = ?

Assessment for Learning
Refer leaners to exercise 1 on the Learner's Book page 123.

Suggested Home Work
Solve these subtraction sentences. Use compensation strategy.
1) 68 − 29 = ? 2) 57 − 38 = ?
3) 96 − 48 = ? 4) 88 − 67 = ?

Lesson 2: Subtraction (using friendly jumps)

Starter
Play: "10 less than". Mention a number and learners subtract 10 from it. E.g.
1) 30 → 20 2) 15 → 5 3) 37 → 27

Let Us Learn
- Put learners into groups of five. Give them this subtraction sentence to solve.

  62 → 35 = ?
- Allow them to use any strategy. Let them compare their answers to the other groups and discuss the strategy they used ***(critical thinking, collaborative learning, problem solving skills)***
- Method (1) 62 − 35 = ?, change it to the addition sentence 35 + ☐ 6. Learners explain the meaning of the addition sentence 35 + what = 62. Let learners understand that we are going to add up from 35 till we get t0 62. Then the answer will be the sum of what we added.

  so 35 + ☐ = 62

  Add 5 to 35 to get 40

  Add 10 to 40 to get 50

  Add 10 to 50 to get 60

  Add 2 to 60 to get 62

  Let learners write the sum of what were added. ie 5 + 10 + 10 + 2 = 27

  so 62 − 35 = 27
- Have learners use the number line and count the number of jumps. The number of jumps gives the answer.
- Refer learners to page 120 of the Learner's Book. Go through the exercise with them.

Review Exercise
Solve these subtraction sentences using friendly jumps.

Differentiated Lessons
Low Ability Learners
1) 32 − 18 = ? 2) 58 − 39 = ?

High Ability Learners
1) 82 − 45 = ? 2) 77 − 48 = ?

Assessment for Learning
Refer leaners to exercise 2 on the Learner's Book page 123.

Suggested Home Work
Use friendly jumps strategy to solve these subtraction sentences.
1) 55 − 36 = ? 2) 68 − 39 = ?
3) 86 − 47 = ? 4) 82 − 46 = ?

For additional exercises on this module, refer to pages 87 - 90 of the Workbook

Module 10: Subtraction of 2 and 3 digit numbers

Content Standard
B3.1.2.4: Develop and apply personal and standard strategies for adding and subtracting within 1000

Indicator
B3.1.2.4.1: Use a variety of personal strategies for adding within 1000

Learning Expectation
Learners will be able to solve 2-two digit and 3-three-digit numbers.

Essentials for Learning
Learners can solve addition with sum up to 100.

New Words
Multi-base block, decompose

Resources
Multi base block, straws, abacus.

Number of Lessons 2

Lesson 1: Addition of two -2-digit numbers

Starter
Play; "10 more than". Mention a number and learners add another number to it to make 10.
1) 6 → 4 2) 4 → 6
3) 7 → 3 4) 2 → 8

Find Out
Refer learners to page 124 of the Learner's Book. Have learners work in pairs to solve the problem. 52 + 17 = ? Elicit from them how they solved it. i.e. The strategy used (critical thinking, collaborative learning, problems solving skills).

Let Us Learn
- Introduce the multi base block to learners. The flat, the rod and the cubes. Flat = 100m rod = 10, cube = 1. Ask learners to model the Find Out question.
- Write this sentence on the board 45 + 32 = ?
- In their groups give them multi base block to model the question and find the answer. In pairs have learners solve these 63 + 28 = ? ***(critical thinking, collaborative learning, attention to precision)***
- Refer learners to Learner's Book page 124 to 125. Go through the 2 questions with learners 47 + 38 = ? and 226 + 57 = ? Learners model the questions and solve them.
- Start adding the tens first before adding the ones.
- Ask: What do you do when the cubes are more than 10?
- Expected answer, you replace 10 cubes with 1 rod

Review Exercise
Solve these addition sentences.

Differentiated lessons
Low Ability Learners
1) 26 + 33 = ? 2) 44 + 35 = ?

High Ability Learners
1) 62 + 37 = ? 2) 48 + 27 = ?

Assessment for Learning
Refer leaners to Learner's Book page 127 for exercise.

Suggested Home Work
Solve these addition sentences.
1) 47 + 22 = ? 2) 58 + 31 = ?
3) 26 + 37 = ? 4) 36 + 48 = ?

Lesson 2: Addition of three-3-digit numbers

Starter
Play; "10 more than". Mention a number and learners add another number to it to make 10.
1) 6 → 4 2) 4 → 6 3) 7 → 3 4) 2 → 8

Let Us Learn
- Put learners into groups of five. Give them the multi base block to solve this 45+39=? Learners exchange their work and make corrections where necessary. Now introduce the block as 1000 to learners. Write these sentences on the board for learners to solve. 324 + 46 = ? Now learners model the question with the multi based block and solve it (critical thinking, collaborative learning, attention to precision). Draw
- Write these on the board for learners to work in pairs. 1) 452 + 46 = ?
  2) 602 + 27 = ?
- Refer learners to Let us Learn: 2 on the Learner's Book page 126. Go through the question with learners. Let them model first. 364 + 278. Learners can add from left to right or vice-versa ***(critical thinking, collaboration learning, attention to precision)***

Review Exercise
Solve these addition problems.

Differentiated Lessons
Low Ability Learners
1) 222 + 46 = ? 2) 534 + 44 = ?

High Ability Learners
1) 548 + 36 = ? 2) 246 + 592 = ?

Assessment for Learning
Refer leaners to Learners Book page 128 to 129 for exercise.

Suggested Home Work
Solve these addition sentences.
1) 67 + 92 = ? 2) 136 + 345 =?
3) 278 + 541 = ? 4) 328 + 437 = ?

For additional exercises on this module, refer to pages 91 - 96 of the Workbook

Module 11: Subtraction of 2 - and 3-digit numbers

Content Standard
B3.1.2.4: Develop and apply personal and standard strategies for adding and subtracting within 1000.

Indicator
B3.1.2.4.2: Use a variety of personal and standard strategies to solve different types of subtraction and addition equations and problems with missing numbers in all positions

Learning Expectations
Learners will be able to solve subtraction of 2- and 3-digit numbers using a variety of strategies.

Essentials for Learning
Learners can do addition of 3-digit numbers with regrouping.

New Words
Base ten block, abacus, subtract.

Resources
Multi base block, abacus, straws.

Number of Lessons 2

Lesson 1: Subtraction of 2-digit numbers.

Starter
Play;"10 less than". Call out a number and learners subtract 10 from it and solve it. E.g.
1) 12 → 2 2) 20 → 10 3) 16 → 6

Find Out
Refer learners to Find Out on page 130 of the Learner's Book. Learners work in pairs to solve it. 53 − 7 = ? Learners come out with the strategy used.

Let Us Learn
Write a subtraction sentence on the board. 66 − 24 = ? Ask learners to model 66 and subtract 24 from it by removing 2 rods and 4 cubes. They count the remaining blocks and write the answer. Repeat this with different numbers. Have learners work in pairs ***(critical thinking, collaborative learning, attention to precision)***
Learners use the Hundred frame to solve these 1) 65 − 24 = ? 2) 86 − 38 = ?

H	T	O
	8	6
-	3	8
	4	8

Take 1 ten from 8 tens break it into ones as 10 ones. Add to 6 ones to get 16 subtract 8 from 16 to get 8. Now you are left with 7 tens, take away 3 tens and you will be left with 4 tens and 8 ones. So 86 − 38 = 48
Refer learners to Learner's Book page 130 to 131. Go through the 3 questions with learners using the 100 frame and the base ten block.

Review Exercise
Work these using the Hundred frame or the multi base block.

Differentiated Lessons
Low Ability Learners
1) 74 − 31 = ? 2) 54 − 28 = ?

High Ability Learners
1) 62 − 36 = ? 2) 134 − 42 = ?

Assessment for Learning
Refer leaners to Learner's Book page 134 for exercise.

Suggested Home Work
Solve these subtraction questions.
1) 72 − 31 = ? 2) 65 − 28 = ?
3) 92 − 65 = ? 4) 342 − 53 = ?

Lesson 2: Subtraction of 3-digit numbers.

Starter
Play;"10 less than". Call out a number and learners subtract 10 from it and call the number. E.g. 1) 12 → 2 2) 20 → 10

3) 16 → 4) 30 → 20

Let Us Learn
- Put learners into groups of five. Write these questions on the board for learners to solve 62 − 26 = ? . They compare their answers with the other groups.
- Write 472 − 246 on the board. Have learners use the base ten block and Hundred frame to solve it.

H	T	O
4	76	212
2	4	6
2	2	6

So 472 − 246 = 226
- Working in pairs, have learners solve these 542 − 361 = ? ***(critical thinking, collaborative learning, attention to precision)***
- Refer learners to Learner's Book page 132 to 133. Go through the 2 questions with learners using the frame and the multi-base block.

Review Exercise
Use the hundred frame to solve these subtraction sentences.

Differentiated Lessons
Low Ability Learners
1) 62 − 46 = ? 2) 348 − 152 = ?

High Ability Learners
1) 680 − 269 = ? 2) 724 − 532 = ?

Assessment for Learning
Refer leaners to Learners Book page 134 for exercise.

Suggested Home Work
Solve these subtraction sentences using the Hundred frame.
1) 92 − 65 = ? 2) 436 − 142 = ?
3) 781 − 592 = ? 4) 885 − 728 = ?

For additional exercises on this module, refer to pages 97 - 100 of the Workbook

Module 12: Addition of whole numbers (1)

Content Standard
B3.1.2.4: Develop and apply personal and standard strategies for adding and subtracting within 1000.

Indicator
B3.1.2.4.2: Use a variety of personal and standard strategies to solve different types of subtraction and addition equations and problems with missing numbers in all positions

Learning Expectations
Learners will be able to solve addition problems.

Essentials for Learning
Learners can solve addition problems with sum up to 100.

New Words
Partial sum, splitting, friendly jumps. hundred , tens

Resources
Number line cards.

Number of Lessons 3

Lesson 1: Adding two 2−digit numbers.

Starter
Play;" Making 10s". Mention a number and learners top up that number to make 10.
eg. 1) 6 →4 2) 8 → 2 3)10→0 4) 9→1

Find Out
Refer learners to page 135 of the Learner's Book. Learners work in pairs. Let them find the missing numbers in the question. They should work in pairs.
Ask: What must be added to 35 to get 80?
That is 35 + ? = 80. Learners solve and explain the strategy used with other group members.

Let Us Learn

- Put learners in groups of five. Write this sentence on the board.
- 35 + 25 = ? Ask learners to use splitting or partial sum to solve it.

35 + 28
↓ ↓
30 + 5 20 + 8
30 + 20 + 5 + 8
60 + 5 + 5 + 3
60 + 10 + 3
70 + 3
73 so 35 + 28 = 73

- In pairs have learners use the same strategy to solve these addition sentences.
  1) 26 + 55 = ? 2) 42 + 38 = ?

(critical thinking, collaborative learning, attention to precision)

- Refer learners to page 135. Go through Learn 1 with learners.
  45 + 27 = ? Split /decompose the 2 numbers and add.

45 + 27
↓ ↓
40 + 5 + 20 + 7
40 + 20 + 5 + 7
60 + 5 + 5 + 2
60 + 10 + 2 = 72

Review Exercise
Use splitting or decomposing strategy to solve these addition sentences.

Differentiated Lessons
Low Ability Learners
1) 25 + 32 = ? 2) 16 + 53 = ?

High Ability Learners
1) 52 + 46 = ? 2) 38 + 37 = ?

Assessment for Learning
Refer leaners to Learner's Book page 135 to 136 for exercise.

Suggested Home Work
Use splitting /decomposing strategies to solve these.
1) 48 + 53 = ? 2) 72 + 19 = ?
3) 39 + 46 = ? 4) 55 + 45 = ?

Lesson 2: Adding 2-digit to 3-digit Numbers

Starter

Play;" Making 10s". Mention a number and learners top up that number to make 10. E.g.
1) 6 → 4 2) 8 → 2 3) 7 → 3 4) 0 → 10

Let Us Learn

- Put learners into groups of five. Work these examples with learners, explain step by step. 164 + 42 = ?
  Split/decompose 164 and 42
  164 = 100 + 60 + 4, 45 = 40 + 2
  100 + 40 + 60 + 4 + 2
  = 100 + 100 + 6 (add 10s and 1s)
  = 200 + 6 (add 100s and 1s)
  = 206
  So 164 + 42 = 206
- Write these for learners to work in groups of five. 1) 264 + 46 = ? 2) 368 + 35 = ? ***(critical thinking, collaboration learning, attention to precision)***
- Refer learners to Let us Learn: 2 on page 137. Go through the question 268 + 42 = ? with learners.

Review Exercise

Use splitting or decomposition strategy to solve these.

Differentiated Lessons

Low ability Learners

1) 224 + 34 = ? 2) 432 + 38 = ?

High Ability Learners

1) 428 + 64 = ? 2) 577 + 76 = ?

Assessment for Learning

Refer leaners to Learner's Book page 139 for exercise.

Suggested Home Work

Use splitting /decomposing strategy to solve these addition sentences.
1) 136 + 33 = ? 2) 248 + 55 = ?
3) 472 + 88 = ? 4) 606 + 58 = ?

Lesson 3: Adding 3-digit numbers

Starter

Play;" Making 10s". Mention a number and learners top up that number to make 10. E.g.
1) 0→10 2) 8→2 3) 5→5 4) 1→9

Let Us Learn

- Write this on the board. 224+163. Have learners split/decompose the 2 numbers as follows:
  224 = 200 + 20 + 4
  163 = 100 + 60 + 3
  So, 200 + 100 + 20 + 60 + 4 + 3
  (group 100s, 10s and 1s together and add)
  200 + 100 + 20 + 60 + 4 + 3
  300 + 50 + 7 = 387
  So, 224 + 163 = 387
- Working in pairs have learners solve these addition sentences. 1) 364 + 23 2) 408 + 235 ***(critical thinking, collaborative learning attention to precision)***
- Refer learners to Learner's Book page 137. Go through the question with them. 342 + 269 = ?

Review Exercise

Use splitting/decomposing strategy to solve these addition sentences.

Differentiated Lessons

Low Ability Learners

1) 242 + 322 = ? 2) 406 + 326 = ?

High Ability Learners

1) 438 + 582 = ? 2) 328 + 584 = ?

Assessment for Learning

Refer leaners to Learner's Book page 139 for exercise.

Suggested Home Work

Solve these
1) 223 + 325 = ? 2) 548 + 126 = ?
3) 456 + 366 = ? 4) 702 + 416 = ?

For additional exercises on this module, refer to pages 101 - 103 of the Workbook

Module 13: Addition of whole numbers (2)

Content Standard
B3.1.2.4: Develop and apply personal and standard strategies for adding and subtracting within 1000.

Indicator
B3.1.2.4.2: Use a variety of personal and standard strategies to solve different types of subtraction and addition equations and problems with missing numbers in all positions

Learning Expectations
Learners will be able to use compensation strategy to solve addition problems of whole numbers with sum up to 1000.

Essentials for Learning
Learners can solve addition problems using compensation strategy with two 3-digit numbers.

New Words
Compensate, making 10s and 100s.

Resources
Number line cards.

Number of Lessons 2

Lesson 1: Addition of whole numbers using "making 10s and 100s" strategy.

Starter
Play; "Making 10s". Call out a number and learners top up that number to make 10. E.g.
1) 1→9 2) 6→4 3) 3→7 4) 0→10

Find Out
Refer learners to Learner's Book page 140. Have learners work in pairs. They study the patterns carefully and come out with the rules. For movement upwards and downwards and movement from right to left and vice-versa. (Note: learners know this movement already). They work in pairs and fill the gaps.

Let Us Learn

- Have learners work in groups of five. Play: "Make multiple of 10s" with learners. Mention a number and learners add another number to make the number a multiple of 10s.
  1) 57 → 60 2) 69 → 70
  3) 78 → 80 4) 99 → 100
  5)198 → 200 ***(critical thinking, collaborative learning, attention to precision)***
  Write this number on the board. 45 + 48 = ? 457 + 38 = ? Ask learners which of the 2 numbers is easier to make it a multiple of 10s. So, move 2 from 45 and add to 48 to become 50. The question now reads 43 + 50 = ? Break 50 into 10s and add 43 + 10 + 10 + 10 + 10 = 93 or 43 + 20 + 20 +10 = 93 ***(critical thinking, collaborative learning, problems solving skills)***
- The number line also could be used.
- Have learners work in pairs to solve these sentences.
  1) 36 + 25 = ? 2) 65 + 26 = ?
- Add 497 + 326 = ? Ask learners the easier number to be made a multiple of 100, ie 497. Remove 3 from 326. Add it to 497 to get 500. The question now reads 500 + 323. Break 323 as 300 + 20 + 3 → 500 + 300 + 20 + 3 = 800 + 20+ 3 + = 823
- How do you solve addition of 2-3-digit numbers?
- Refer learners to Learner's Book page 140 and 141.

Review Exercise
Use compensation strategy to solve these addition questions.

Differentiated Lessons
Low Ability Learners
1) 68 + 35 = ? 2) 28 + 38 = ?

High Ability Learners
1) 43 + 58 = ? 2) 236 + 198 = ?

Assessment for Learning
Refer leaners to Learner's Book page 142 to 143 for exercise.

Suggested Home Work
1) 42 + 38 = ? 2) 58 + 47 = ?
3) 327 + 285 = ? 4) 467 + 294 = ?

Lesson 2: Addition of two 2- and three 3- digit numbers (using compensation strategy).

Starter

Play;" Making 10s". Mention a number and learners top up that number to make 10. E.g.
1) 1→9 2) 6 → 4 3) 0 → 10 4) 1→ 9

Let Us Learn

- Write this sentence on the board 246 + 39 = ? Learners brainstorm how to get the answer. Discuss with learners how they got the answers.
- Ask learners the number which is nearer to multiples of 10s. that is 39. Learners add 1 to 39, to get 40. The sentence now reads 246 + 40 = 286. To get the answer correct, we have to subtract 1 from the answer because we added 1 more than was expected, 286 -1 = 285. So 246 + 39 = 285
- **Second method**: 246 + 39 = ? We move 1 from 246 and add to 39 to get 40. The sentence now reads 245 + 40 = 285. Have learners work this in pairs 326 + 47 = ? ***(problems solving skills, critical thinking, collaborative learning)***
- Adding 3-digit numbers to another 3-digit numbers.
- Using the same strategy. Have learners solve this 346 + 299 = ? Learners move 1 from 346 and add to 299 to get 300. The question now reads 345 + 300 = ?
- So 345 + 300 = 645.
- Refer learners to Let us Learn: 2 on page 141 to 142 of the Learner. Go through a question 1 a, 1 b and 2 with learners ***(critical thinking, collaborative learning, problems solving skills)***
-
- Note: **Compensation strategy work best when one of the numbers could be made a multiple of 10s easily.**
- Question: How do you use compensation strategy to solve addition problems? Discuss in pairs.

Review Exercise

Use compensation strategy to solve these addition sentences.

Differentiated Lessons

Low Ability Learners

1) 144 + 29 = ? 2) 203 + 38 = ?

High Ability Learners

1) 433 + 197 = ? 2) 255 + 293 = ?

Assessment for Learning

Refer leaners to Learner's Book page 143 for exercise.

Suggested Home Work

Solve these addition sentences. Use compensation strategy.
1) 299 + 361 = ? 2) 638 + 28 = ?
3) 734 + 291= ? 4) 525 + 293 = ?

For additional exercises on this module, refer to pages 104 - 108 of the Workbook

Module 14: Subtraction of whole numbers (1)

Content Standard
B3.1.2.4: Develop and apply personal and standard strategies for adding and subtracting within 1000.

Indicator
B3.1.2.4.2: Use a variety of personal and standard strategies to solve different types of subtraction and addition equations and problems with missing numbers in all positions

Learning Expectations
Learners will be able to use different strategies to solve subtraction problems.

Essentials for Learning
Learners can use different strategies in solving addition problems.

New Words
Counting up, decompose, friendly jumps, count

Resources
Number line cards, subtraction sentence cards.

Number of Lessons 3

Lesson 1: Subtraction three 3-digit numbers decomposition strategy.

Starter
Play; "10 less than". Mention or call out a number and learners subtract 10 from it and call out the number. E.g. 1) 30→20 2) 65→55 3) 100→90 4) 77→67

Find Out
Refer learners to page 144 of the Learner's Book. Have learners work in pairs to solve the question 459-39=? Learners compare their answers with other groups and discuss the method used in solving it.

Let Us Learn
- Have learners work in groups. Write 264 - 53 on the board. Learners decompose 53 as 50 + 3 and do the subtraction. So the question now reads
  264 − 50 − 3
  214 − 3 = 211
- Give another question for learners to solve 438 − 36 = ? ***(critical thinking, collaborative learning, attention to precision)***
- Now have learners in pairs solve this 865 − 354 = ? Learners split/decompose 354 as 300 + 50 + 4

  865 − 300 + 50 + 4 = 505
  865 − 300 = 565
  565 − 50 = 515
  515 − 4 = 511 so 865 − 354 = 511
- Refer learners to Learner's Book page 144. Go through the questions at Learn 1 with learners (critical thinking, collaborative learning, attention to precision)
- In pairs answer this question. How is decomposition strategies used in Solving Subtraction problems?

Review Exercise
Split /decompose the second number and solve these subtraction questions.

Differentiated Lessons
Low Ability Learners
1) 176 − 42 = ? 2) 368 − 143 = ?

High Ability Learners
1) 386 − 242 = ? 2) 568 − 345 = ?

Assessment for Learning
Refer leaners to Learner's Book page 147 for exercise.

Suggested Home Work
Solve these subtraction sentences.
1) 436 − 34 = ? 2) 437 − 45 = ?
3) 668 − 443 = ? 4) 368 − 143 = ?

Lesson 2: subtraction 3-digit numbers.

Starter
Play; “10 less than”. Mention or call out a number and learners subtract 10 from it and call out the number. E.g. 1) 30 → 20
2) 65 → 55 3) 100 → 90 4) 77 → 67

Let Us Learn
- Put learners into groups of five. Write this subtraction sentence on the board. 64 − 22 = ? Learners count up/on by 10s starting from 22. We add the number of counts/ jumps to get the answer.

10 + 10 + 10 + 10 + 2 = 42 so 64 − 22 = 42
- Have learners use the same strategy to solve this 244 − 35 = ?
- Refer learners to Let us Learn: 2 of the Learners Book page 145 to 146. Go through question 1 and 2 with learners.

Review Exercise
Use friendly jumps to solve these subtraction problems.

Differentiated Lessons
Low Ability Leaners
1) 89 − 25 = ? 2) 168 − 35 = ?

High Ability Learners
1) 432 − 42 = ? 2) 266 − 122 = ?

Assessment for Learning
Refer leaners to Learner's Book page 148 to 149 for exercise.

Suggested Home Work
Work these subtraction problems.

1) 567 − 46 = ? 2) 325 − 126 = ?
3) 326 − 136 = ? 4) 658 − 442 = ?

For additional exercises on this module, refer to pages 109 - 113 of the Workbook

Module 15: Subtraction of whole numbers (2)

Content Standard
B3.1.2.4: Develop and apply personal and standard strategies for adding and subtracting within 1000.

Indicator
B3.1.2.4.2: Use a variety of personal and standard strategies to solve different types of subtraction and addition equations and problems with missing numbers in all positions

Learning Expectation
Learners will be able to solve subtraction sentences with a variety of strategies.

Essentials for Learning
Learners can use decomposition and friendly jumps to solve addition and subtraction sentences.

New Words
Constant differences, friendlier, compensation.

Resources
Number line cards.

Number of Lessons 3

Lesson 1: Subtraction using compensation strategy.

Starter
Play; "2 more than". Call out a number and learners add 2 to that number and call out. E.g.
1) 6→8 2) 10→12 3) 6→8 4) 10→12

Find Out
Refer learners to Learner's Book page 150. Have learners work in pairs. Learners discuss how they will solve 53 − 19 = ? and 158 − 48 = ? Which strategy did you use? Leaners compare their work with other pairs.

Let Us Learn
- Put learners into groups of five. Write this sentence on the board. 86 − 48 = ? To make the subtraction easier add 2 to 48 to make 50.
- The subtraction sentence now reads 86 − 50 = 36. But we have to add 2 to the answer because we subtracted 2 more than expected.

So 86 − 50 = 36 + 2
86 − 48 = 38
- Have learners solve this in pairs.
  1) 72 − 37 = ? 2) 143 − 29 = ?
- Refer learners to Learner's Book page 150 Let Us Learn. Go through the 2 exercises with learners using the compensation strategy.
  185 − 46 = ? 2) 525 − 393 = ?
- Ask learners what must be added to 46 to get multiples of 10? And what must be added to 393 to get 400. Learners discuss in their groups and solve them.

Review Exercise
Solve these subtraction sentences.

Differentiated Lessons
Low Ability Learners
- Work in pairs. 1) 65 − 28 = ?
  2) 86 − 39 = ?

High Ability Learners
1) 365 − 49 = ? 2) 255 − 47 = ?

Assessment for Learning
Refer leaners to Learner's Book page 152 for exercise.

Suggested Home Work
Use compensation strategy to solve these subtraction sentences.
1) 92 − 48 = ? 2) 65 − 39 = ?
3) 465 − 57 = ? 4) 472 − 5 = ?

Lesson 2: Subtraction (using constant difference)

Let Us Learn

- Put learners into groups of five. Write this subtraction sentence on the board. 65 − 28 = ? Explain to learners as follows. 65 − 28 = ? Add 2 to both numbers to get → 67 − 30 =? 67 − 30 = 37 so 65 − 25 = 37.
- Write these for learners to work in groups. They compare their answers with other group members.
  1) 86 − 37 = ? 2) 387 − 88 = ?
- Refer learners to Learner's Book page 151. Learners work in pairs to solve the 2 question. Go through question 2 with learners using constant difference. 488 − 343 = ? Subtract 3 from each number to get 485 − 340 = ? 485 − 340 = 227.
- We can also use the number line to solve it.
- Refer to page 151 of Learners book 3.

Review Exercise

Differentiated Lessons
Low Ability Learners
1) 74−31=? 2) 64−38=?

High Ability Learners
1) 333 − 27 = ? 2) 265 − 72 = ?

Assessment for Learning
Refer leaners to Learner's Book page 153 for exercise.

Suggested Home Work
Use constant difference strategy to solve these subtraction sentences.
1) 87 − 43 = ? 2) 246 − 43 = ?
3) 426-38=? 4) 789 − 428 = ?

For additional exercises on this module, refer to pages 114 - 116 of the Workbook

Module 16: Word problems addition and subtraction

Content Standard
B3.1.2.4 : Develop and apply personal and standard strategies for adding and subtracting within 1000 CONT'D

Indicator
B3.1.2.4.3: Develop and explain estimation strategies to estimate the solution for a given word problem involving addition or subtraction sums up to 1000

Learning Expectations
Learners will be able to solve addition and subtraction word problems using estimation strategy.

Essentials for Learning
Learners can use compensation strategy to solve addition and subtraction problems.

New Words
Estimate, guess, frontend

Resources
Numeral cards.

Number of Lessons 2

Lesson 1: Word Problem Addition (using estimation strategy).

Starter
Play; "Guess my number". E.g. I am thinking of a number. It is a multiple of 2. It is more than 8 but less than 12. What is the number?

Find Out
Refer learners to Learner's Book page 154.
Ask learners different questions.
Learners discuss in pairs. What strategy will you use to solve it? Why?
What answer did you get? Compare the answer with the next learner.

Let us Learn
- Put learners into groups of five, write this sentence on the board 230 + 462 = ? Round 230 down as 200 and round 462 up as 500. So the question now reads 200 + 500 = 700.
- Explain to learners that if the ones is 5 or more than 5, we round it up to tens. E.g. 1) 76→80 2) 55→60. If the ones is less than 5 we round it down. E.g. 1) 44→40 2) 33→30
- Explain to learners that when the number is above 50, we round it up to 100s. e.g. 1) 365→400 2) 450→500.
- When the number is less than 50, we round it down. E.g. 338→300 2) 649→600
- Write this on the board 1)76 + 34 = ? Round 76 up as 80 and round 34down as 30. So, the question now reads 80+30=110. 2) 264 + 320 → 300 + 300 = 600
- Refer learners to Learners Book page 154 to 156. Go through the questions at Learn 1 with learners. 1) 86 + 24 = ? round off 86 as 80 and 24 as 20 let them add 80 + 20 = 100

Review Exercise
Estimate by rounding off the numbers and find the sum.

Differentiated Lessons
Low Ability Learners
75 + 14 = ? 2) 58 + 29 = ?

High Ability Learners
1) 158 + 229 = ? 2) 329 + 403 = ?

Assessment for Learning
Refer leaners to Learner's Book page 160 for exercise.

Suggested Home Work
Use estimated strategy to solve these.
1) 85 + 34=? 2) 72 + 44 = ?
3) 528 + 357 = ? 4) 266 + 162 = ?

Lesson 2: Word problem subtraction (using estimation strategy).

Starter
Play; “Guess my number”. E.g. I am thinking of a number. It is a multiple of 2. It is more than 8 but less than 12. What is the number?

Let Us Learn
- Put learners into groups of five. Write this subtraction sentence on the board. 560 − 422 = ? Learners discuss in their groups how they will estimate the numbers to solve the questions. Learners round up 560 as 600, and round down 422 as 400. So, the question now reads 600-400 = 1000.
- Write these subtraction sentences for learners to solve in pairs 1) 453 − 236 = ?
  2) 666 + 439 = ?
- Refer learners to Learner's Book page 157 to 159. Go through Let us Learn: 2 with learners.
- Ask how they could round off the numbers to do the subtraction. Have them work in pairs.
  1) 68 − 42 = ? 2) 848 − 352 = ?
  = 70 + 40 = 110 = 800 + 400 = 1200

Review Exercise

Differentiated Lessons
Round up or down to solve these subtraction sentences.

Low Ability Leaners
1) 51 − 39 = ? 2) 135 − 62 = ?

High Ability Learners
1) 309 − 168 = ? 2) 865 − 462 = ?

Assessment for Learning
Refer leaners to Learner's Book page 161 for exercise.

Suggested Home Work
By rounding up and down, solve these subtraction sentences.
1) 72 − 48 = ? 2) 338 − 136 = ?
3) 569 − 309=? 4) 896 − 642 = ?

For additional exercises on this module, refer to pages 117 - 122 of the Workbook.

Module 17: Commutative property of addition

Content Standard
B3.1.2.4 : Develop and apply personal and standard strategies for adding and subtracting within 1000 CONT'D

Indicator
B3.1.2.4.3: Develop and explain estimation strategies to estimate the solution for a given word problem involving addition or subtraction sums up to 1000

Learning Expectations
Learners will be able to identify that, interchanging the positions of the addends do not change the result.

Essentials for Learning
Learners can use different strategies to solve addition problems with sum up to 1000.

New Words
Add, change, order, addends, sum.

Resources
Numeral cards.

Number of Lessons 1

Lesson 1: Commutative Property of Addition.

Starter
Play;" Making 100s. Call out a number and learners add up another number to make 100.
E.g. 1) 93→7 2) 60→40
3) 80→20 4) 100→0

Find Out
Refer learner's to page 162 of the Learner's Book. Have learners work in pairs. Ask learners,
How many birds are in A?
How many birds are in B?
How many birds are in C?
Now, ask learners to compare AxB to DxE, C and F and discuss their findings, and draw conclusion: 15 + 20 = 35 = 20 + 15 = 35.

Let us Learn
- Have learners work in pairs and solve these addition sentences. 20 + 15 = ?
  15 + 20 = ?
- 20 + 15 = 35 15 + 20 = 35. The answer does not change when the numbers are interchanged. Write these for learners to solve in class. They compare their answers and correct themselves where necessary.
  1) 20 + 30 = ? 2) 36 + 29 = ?
  30 + 20 = ? 29 + 36 = ?
- In pairs have learners write their own addition sentences and solve them, they interchange the addends and solve them. They compare their answer to the first question and draw conclusion that when addends positions are interchanged, the result is the same.
- Refer learners to Learner's Book page 163. Go through the 2 questions with learners.
  1) 26 + 14, 14 + 26 = ☐
  2) 425 + 353, 353 + 425 = ☐

Review Exercise
Solve these addition questions.
Draw your conclusions.

Differentiated Lessons
Low Ability Learners
1) 25 + 30 = ☐ 30 + 25 = ☐
2) 65 +15 = ☐ 15 + 65 = ☐

High Ability Learners
Write 2 addition sentences on your own. Interchange the positions of the addends and solve them. What do you notice?

Assessment for Learning
Refer leaners to Learner's Book page 164 for exercise.

Suggested Home Work
Work these addition sentences.
What do you say?
1) 40 + 35 = ☐ 35 + 40 = ☐
2) 73 + 24 = ☐ 24 + 73 = ☐
3) 200 + 154 = ☐ 154 + 200 = ☐
4) 250 + 140 = ☐ 140 + 250 = ☐

For additional exercises on this module, refer to pages 123 - 125 of the Workbook.

Module 18: Multiplication (1)

Content Standard
B3.1.2.5: Demonstrate an understanding of multiplication up to 5 x 5

Indicator
B3.1.2.5.1: Represent and explain multiplication using equal groupings

Learning Expectations
Learners will to be able to represent and explain multiplication using equal groupings.

Essentials for Learning
Learners can group objects-based on a given criteria.

New Words
Multiplication, equal groupings, groups, multplies.

Resources
Bottle caps, seeds, pebbles.

Number of Lessons 1

Lesson:1 Multiplication using equal groupings.

Starter
Play; "making Doubles". Call out a number and learners multiply by 2 and call out the number.
E.g. 1) 2→4 2) 10→20
3) 30→60 4) 100→200

Find Out
Refer learners to page 165 of the Learner's Book. Have learners work in pairs. They discuss among themselves how they got the answer to the repeated addition.

Let Us Learn
- Put learners into groups of five. Give them 12 bottle caps. Have learners make equal groupings of the twelve caps.

e.g. 2 groups of 6 → 2 x 6 = 12
3 groups of 4 → 3 x 4 = 12
4 groups of 3 → 4 x 3 = 12
1 group of 12 → 1 x 12 = 12
12 groups of 1 → 12 x 1 = 12

- Learners go round and discuss among other group members the number of times they made the equal groupings.
- Give them 10 bottle caps and ask learners to put them into different equal groupings. They compare with other group members and find out the number of equal groupings they made ***(critical thinking, collaborative learning, problems solving skills)***
- Refer learners to Learner's Book page 165 to 166. Go through the exercises with learners. Learners tell you the number of groupings and the number of balls in each group. Introduce the multiplication sign (x) and tell them that instead of counting and adding, we can just multiply the number of groupings by the number of objects in the group.
So the 4 groups of 3 balls reads 4 x 3 = 12.
- Learners write the multiplication sentences for questions 2 – 6.

Review Exercise
Leaners work with partners.

Differentiated Lessons
Low Ability Learners
- Give out 16 bottle caps to learners to make 5 different equal groupings.

High Ability Learners
- Give out 24 bottle caps to them. They make 8 different groupings.

Assessment for Learning
Refer leaners to Learner's Book page 167 to 169 for exercise.

Suggested Home Work
Use 16 triangles to make 5 equal groupings. Write the multiplication sentences and solve them.

For additional exercises on this module, refer to pages 126 - 129 of the Workbook.

Module 19: Multiplication (2)

Content Standard
B3.1.2.5: Demonstrate an understanding of multiplication up to 5 x 5 CONT'D

Indicator
B3.1.2.5.2: Represent and explain multiplication using rectangular arrays;

Learning Expectations
Learners will be able to arrange objects in rows and columns, write a multiplication sentence for it and solve it.

Essentials for Learning
Learners can make equal groupings of a given number of objects.

New Words
Arrays, dots, across, vertical, horizontal, intersection, rows, columns.

Resources
Multiplication sentence cards, straws, bottle caps.

Number of Lessons 2

Lesson 1: Multiplication using arrays of dots

Starter
Play; "making Doubles". Call out a number and learners multiply it by 2 and call out the number. E.g. 1) 2→4 2) 10→20
3) 30→60 4) 100→200

Find Out
Refer learners to Learner's Book page 170. Whole Class Lesson. Ask learners the following questions.
How many legs has 1 cow?
How many legs have 2 cows?
How many legs have 3 cows?

Let Us Learn
- Use the sitting arrangement in the classrooms to teach rows and columns.
- Call the first-row learners to stand up. Second, third etc.
- Now, call out learners in the columns to do the same. Learners write the multiplication sentences for the number of learners in the class. E.g. 10 rows x 6 columns ***(critical thinking, collaborative learning, attention to precision).***
- Have learners work in groups of five. Give out 20 straws to each group to arrange them into rows of 5. Learners identify the number of rows and columns and write the multiplication sentence for it. ie 4 x 5 = ?
- Learners discuss among themselves to identify that the rows is the same as the "horizontal" and the columns is the same as the "vertical". Have learners model these sentences with bottle caps.
- 1) 6 x 2 2) 5 x 3 3)10 x 4
- Refer learners to Learner's Book page 170 to 171. Go through Learn 1 with learners,

Review Exercise

Differentiated Lessons
Low Ability Learners
- Write a multiplication sentence for these arrays of dots.

High Ability Learners
- Model these multiplication sentences with arrays of dots.
  1) 4 x 4 2) 6 x 3

Assessment for Learning
Refer leaners to Learners Book page 173 for exercise.

Suggested Home Work
Model arrays for these multiplication sentences.
1) 3 x 4 2) 5 x 6
Write a multiplication sentence for these arrays of dots.

Lesson 2: Multiplication (using lattice methods)

Starter

Play; “Making Doubles”. Call out a number and learners multiply it by 2 and call out the number. E.g. 1) 2→4 2) 10→20
3) 30→60 4) 100→200

Let Us Learn

- Put learners into groups of five. Give each group 20 straws. Write this multiplication sentence on the board. 2 x 3 = 6. Ask learners to take 2 straws and model it horizontally. Let them take another 3 straws and put them vertically on the horizontal ones.
- Learners count the points of intersections as the answer. So, 3 x 2 = 6. Have learners model 5 x 3 and write the answer (critical thinking, collaborative learning, attention to precision).
- Learners work in pairs and solve these multiplication sentences using the straws.
  1) 5 x 2 = ? 2) 2 x 7 = ? 3) 10 x 2 = ?
- Refer learners to Learner's Book page 172. Go through Learn 2 with learners. Learners use straws for the questions and find the answers.

Review Exercise

Differentiated Lessons

Use straws to solve these multiplication sentences.

Low Ability Learners

1) 4 x 4 = ? 2) 5 x 4 = ?

High Ability Learners

1) 6 x 4 = ? 2) 8 x 6=?

Assessment for Learning

Refer leaners to Learner's Book page 174 for exercise.

Suggested Home Work

Use straws to solve these multiplication sentences.

1) 7 x 2 = ? 2) 10 x 3 = ?
3) 15 x 1 = ? 4) 9 x 9 = ?

For additional exercises on this module, refer to pages 130 - 132 of the Workbook

Module 20: Multiplication (3)

Content Standard
B3.1.2.5: Demonstrate an understanding of multiplication up to 5 x 5 CONT'D

Indicator
B3.1.2.5.2 Represent and explain multiplication using rectangular arrays;

Learning Expectations
Learners will to be able to develop and build the multiplication chart up to 9 x 9 and use the number line to solve multiplication sentences.

Essentials for Learning
Learners can use Lattice method to solve multiplication sentences.

New Words
Skip count, multiplication.

Resources
Number line card

Number of Lessons 3

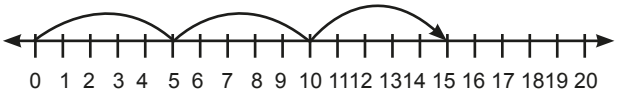
Lesson 1: Multiplication using the number line.

Starter
Play; "10 more than". Call out a number and learners add up to make 10 and shout aloud the number e.g. 1) 0→10 2) 9→1
3) 6→ 4 4) 3 => 7

Find Out
Refer learners to Learner's Book page 175. Ask learners to complete the missing numbers in the multiplication wheel. Learners work in pairs. Ask the following questions.
1. What was done to the 2 and 4 to get 8 ?
2. What was done to the 2 and 6 to get 12 ?
3. What was done to the 2 and 3 to get 6 ?

Learners discuss with their partners and fill in the missing numbers in the location chart.

Let Us Learn
- Draw a number line on the board. Label it 1 – 20. Write a multiplication sentence on the board. 3 x 5 = ? This could be interpreted as 3 rows with 5 columns.



Ask learners:
- How many jumps?
- How many numbers are in a jump?
- Write the multiplication sentence and solve it. 3 x 5 = 15
- Give each group number line cards. They discuss how to solve. 1) 3 x 4 = ?
  2) 2 x 6 = ? and solve them ***(critical thinking, collaborative learning, problems solving skills)***
- Have learners work in pairs. They write their own 2 multiplication sentences and solve them.
- Refer to Learner's book page 178 and 199. Go through the 2 questions with learners. They should work in pairs.

Review Exercise

Differentiated Lessons
Use the number line to solve these multiplication sentences.

Low Ability Learners
1) 4 x 4 = ? 2) 5 x 2 = ?

High Ability Learners
1) 6 x 6 = ? 2) 4 x 5 = ?

Assessment for Learning
Refer leaners to Learner's Book page 176 for exercise.

Suggested Home Work
Draw number lines and use them to solve these multiplication sentences.
1) 3 x 6 = ? 2) 5 x 5 = ?
3) 12 x 2 = ? 4) 9 x 2 = ?

Lesson 2: Multiplication (using the number chart).

Starter
Play; "10 more than". Call out a number and learners add up to make 10 and shout aloud the number e.g. 1) 0→10 2) 9→1
3) 6 → 4 4) 3 → 7

Let Us Learn
- Learners skip count by 2s from 2 up to 30. (whole class). Now learners skip count by 2s from 2 up to 40. Let them work in pairs ***(critical thinking, collaborative learning, attention to precision).***
- Give out the number chart to learners in their groups. They skip count by 2s, 3s, 6s and 10s. They are learning the multiplication table with these numbers (critical thinking, collaborative learning, attention to precision, leadership skills)
- Refer learners to Learner's Book page 176. Have learners work in pairs. They read the doubles of 2, 3, 4, 6, 8 and 9. Let them write 5 multiples of each number.
  e.g. 2:2, 4, 6, 8, 10, 12
  5:5, 10, 15, 20, 25
  9:9, 18, 27, 36, 45, 54
  (critical thinking, collaborative learning, attention to precision).

Review Exercise

Differentiated Lessons

Low Ability Learners
Skip count and read the multiples of 2, 3, 4 from your chart.

High Ability Learners
Skip count and read the multiples of 5 up to 10.

Assessment for Learning
Refer leaners to Learner's Book page 176 for exercise.

Suggested Home Work
Fill in the missing gaps.
5, 10, ____, ____, ____, 30, ____, ____, 45
2, 4, ____, ____, ____, 12, ____, ____, ____
____, ____, 9, 12, ____, _____, _____, 24
_____, _____, ____, 40, ____, 60, ____, ____

Lesson 3: Multiplication game.

Starter
Have learners skip count in 5s up to 100.

Let Us Learn
- This is Group Activity Game. Display a big multiplication chart on the board. give learners instructions as follows.
- Throw a pair of dices in turns (in groups).
- Mark the product made in a throw with a different marker.
- The winner is the group who mark more numbers with the correct products.
- Refer learners to Learner's Book page 177. Learners work in pairs. One throws the pair of /dice. He or she finds the product on the chart with his colour. The partner does the same with a different colour. The winner is the first to have 3 colours in a line horizontally, vertically and diagonally.

For additional exercises on this module, refer to pages 133 - 135 of the Workbook

Module 21: Multiplication

Content Standard
B3.1.2.5: Demonstrate an understanding of multiplication up to 5 x 5 CONT'D

Indicator
B3.1.2.5.2: Represent and explain multiplication using rectangular arrays;

Learning Expectations
Learners will be able to solve multiplication problems using repeated subtraction.

Essentials for Learning
Learners can use number line and array of dots to solve multiplication problems.

New Words
Repeated addition, multiplication.

Resources
Bottle caps, straws.

Number of Lessons 0

Lesson 1: Multiplication (using the repeated addition)

Starter
Learners count and clap simultaneously, 1 – 20.

Find Out
Refer to page 181 of the Learner's Book.
Have learners work in pairs. Ask learners to solve the problem.
How did you get your answer?
Learners discuss how they got their answers.
Is there a shorter/another method of getting the answer without adding on?

Let Us Learn

- Put learners into groups of five. Learners answer these questions. How many legs has a hen? Expected answer 2. What about 2 hens, 3 hens and 4 hens?
  1 hen = 2 legs
  2 hens = 2 + 2 = 4 legs
  3 hens = 2 + 2 + 2 = 6 legs
  4 hens = 2 + 2 + 2 + 2 = 8 legs
- Call a learner to the front of the class. Learners tell the number of eyes of the learner. Keep on calling a learner to the front of the class until there are 5 learners
  1 learner − 2 eyes
  2 learners – 2 + 2 = 4
  3 learners – 2 + 2 + 2 = 6
  4 learners – 2 + 2 + 2 + 2 = 8
  5 learners – 2 + 2 + 2 + 2 + 2 = 10
- Learners tell you the number of times the 2 is appearing e.g. with 5 learners, 2 is appearing 5 times. Refer them to the number chart and let them skip count by 2s five times and tell fill in the answer. Have learners discuss in their group the relationship between addition and multiplication. (When a number is added to itself a certain number of times it is the same as multiplying that number by the number of times it appears). E.g. 2 +2 + 2 + 2 + 2 = 2 x 5 = 10 ***(critical thinking, collaborative learning, attention to precision).***
- Learners write the multiplication sentences for these numbers
  3 + 3 + 3 = 9 2) 5 + 5 + 5 + 5 + 5 = 25
- Refer learners to Learner's Book page 181 to 182. Go through the 4 questions with learners. They work in groups of five and exchange their work with other group members ***(critical thinking, collaborative learning, attention to precision).***
- Learners draw conclusion that repeated addition could be changed to multiplication sentence.

Review Exercise
Write multiplication sentences for these repeated additions sentences.

Differentiated Lessons
Low Ability Learners
1) 3 + 3 + 3 = 9
2) 2 + 2 + 2 +2 + 2 + 2 = 12

High Ability Learners
1) 6 + 6 + 6 + 6 + 6 = ?
2) 7+ 7 +7 + 7+ 7+ 7 = ?

Assessment for Learning
Refer leaners to Learner's Book page 183 for exercise.

Suggested Home Work
Write multiplication sentences for these repeated addition sentences. Find the sum first.
1) 4 + 4 + 4 + 4 = ?
2) 8 + 8+ 8 + 8 = ?
3) 10 + 10 + 10 +10 = ?
4) 9+ 9+ 9 +9=?

For additional exercises on this module, refer to pages 136 - 139 of the Workbook

Module 22: Division (1)

Content Standard
B3.1.2.6: Demonstrate an understanding of division

Indicator
B3.1.2.6.1: Use concrete and pictorial representations to explain division as equal sharing or partitioning equally into given groups and finding how many are in each group.

Learners Expectations
Learners need to be able to solve division problems using equal sharing and equal groupings

Essentials for Learning
Learners have been sharing objects among themselves.

New words
Sharing, division, divide, product, grouping.

Resources
Bottle caps, oranges, pencils.

Number of Lessons 2

Lesson 1: Equal sharing

Starter
Play; "Half of a number". Call out a number and learners give an answer which is half of the number called. e.g. 1) 4→2 2) 2→1
3) 6→3 4) 20→10

Find Out
Refer learners to page 184 of the Learner's Book. Learners say what the two learners are doing and count the number of oranges each of them has.

Let Us Learn
Put 10 books on your table. Call out a boy and a girl to the front of the class. Ask the learners to share the books between them by picking one after the other. They tell the class the number of books each person got. Write the divisions sentence on the board and introduce the division sign to the class. 10 : 2=5. ":" means "divide/share".
Give them 20 bottle caps in their groups. They share among 4 learners, 5 learners and 2 learners respectively write a division sentence for each ***(critical thinking, collaborative learning, attention to precision)***
Refer learners to Learner's Book page 184. Learners act one question there. 36:6. Call 6 learners to the front to share 36 erasers / pencils.

Review Exercise

Differentiated Lessons
Low Ability Learners
- Use diagrams to solve these division sentence. 4 learners share 16 oranges. How many will each get?

High Ability Learners
- 6 learners share 24 mangoes. How many will each get?.

Assessment for Learning
Refer leaners to Learner's Book page 186 to 187 for exercise.

Suggested Home Work
Use diagrams to solve these division sentences.
1) 24:4 2) 12:3 3) 6:2

Lesson 2: Division by Grouping.

Starter
Play; "half of a number". Call out a number and learners give an answer which is half of the number called. e.g. 1) 4→2 2) 2→1
3) 6→3 4) 20→10

Let Us Learn
- Put learners into groups of five. Give out 12 straws to each group. Ask learners to group them into 2 equal groupings. Have learners count the number of straws in each group and write the division sentence. In writing the division sentence, consider

the total number of objects to be shared (dividend). The number of objects in each group (divisor)then the number of equal groupings (answer/quotient)

- Increase the number of straws to 20 and ask learners to put them into 4 equal groupings. They discuss among themselves the number of objects in each group. The total number before sharing and write the division sentence 20 ÷ 5=4 (critical thinking, collaborative learning, attention to precision, problems solving skills)
- Refer learners to Let us Learn 2 of the Learner's Book page 185 to 186. Go through the 2 questions with learners. 36 erasers put them into 6 groupings with the same number of objects in each group. 30 bottle caps. Put them into 10 equal groupings. Learners write division sentence for each question.

Review Exercise
Use diagram for these division sentences.

Differentiates Lessons
Low Ability Learners
8 ÷ 2 = 4

High Ability Learners
24 ÷ 6 = 4

Assessment for Learning:
Refer leaners to exercise 2 of the Learner's Book page 188 and 189.

Suggested Home Work
Write division sentences for these diagrams.
1) 12 ÷ 6 = ? 2) 8 ÷ 2 = ?
3) 10 ÷ 5 = ? 4) 15 ÷3 = ?

For additional exercises on this module, refer to pages 140 - 146 of the Workbook

Module 23: Division (2)

Content Standard
B3.1.2.6: Demonstrate an understanding of division

Indicator
B3.1.2.6.2: Use concrete and pictorial representations to explain division as repeated subtraction or determining the number of times given equal groups can be obtained in (i.e. goes into or can be subtracted from) a given .

Learning Expectations
Learners will be able to solve division problems using repeated subtraction.

Essentials for Learning
Learners can use counting back to do subtraction.

New Words
Sharing, divide, subtract, divisor, dividend, repected, skip count.

Resources Bottle caps, straws, numeral cards number linecords.

Number of Lessons 1

Lesson 1: Division (repeated subtraction)

Starter
Play; "Making doubles. Learners call out a number. Others say a double of that number.
E.g. 1) 2→ 4 2) 5 → 10 3) 8 → 16

Find Out
Refer learners to Find Out on page 190 of the Learner's Book. Ask the following questions.
How many mangoes are there?
How are they going to share them equally?
How many will each person get?

Let Us Learn

- Call two learners to the front of the class. Give them 10 erasers to share. The class tell how many each got. Let them take them one by one. Introduce the division sentence to learners.

  10 ÷ 2 = 5
  ↑ ↑ ↓
  Dividend divisor ÷ quotient
- Write this division sentence on the board. 18 ÷ 3 = ? Give 18 bottle caps to learners. Ask them t0 Keep on subtracting 3 until there is nothing left. Ask learners to count the number of times 3 was subtracted.
  18 − 3 = 15 − 3 = 12 − 3 = 9 − 3 = 6 − 3 = 3 − 3 = 0. Subtracted 6 times.
  So 18 ÷ 3 = 6.
- Write these division sentence on the board for learners to solve using straws/ bottle caps 1) 18 ÷ 2 = ? 2) 30 ÷ 5 = ? (***critical thinking, collaborative learning, attention to precision).***
- Refer learners to Learner's Book page 190 to 192. Go through question 1, 2 and 3 with learners.

Review Exercise

Differentiated Lessons
Solve these division sentences using repeated subtraction.

Low Ability Learners
1) 8 ÷ 2 = ? 2) 12 ÷ 4 = ?

High Ability Learners
1) 36÷6=? 2) 45 ÷ 9 = ?

Assessment for Learning
Refer leaners to Learner's Book page 193 to 194 for exercise.

Suggested Home Work
Solve these division problems using either repeated subtraction or the number line.
1) 30 ÷ 5 = ? 2) 6 ÷ 2 = ?
3) 100 ÷ 10 = ? 4) 81÷ 9 = ?

For additional exercises on this module, refer to pages 147 - 148 of the Workbook

Module 24: Division (3)

Content Standard
B3.1.2.6: Demonstrate an understanding of division

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

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

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

New words
Divide, inverse, multiplication, counting multiply.

Resources
Bottle caps, numeral cards.
Number of lessons 1

Number of Lessons 1

Lesson 1: Division (using inverse multiplication)

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

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

Let Us Learn
- Put learners into groups of five. Write 12 ÷ 3 = ? This could be changed into multiplication sentence as 3 x ? = 12, → 4x 3 = 12, 3 x 4 = 12 or 12÷3=4
- Refer learners to Learner's Book page 195 to 196. Go through Learn 1 with learners.

Review Exercise
Let learners work in pairs. Solve these division sentences.

Differentiated Lessons
Low Ability Learners
1) 4 x 3 = 12
2) 7 x 3 = 21
12 ÷ 4 =
21 ÷ 7 =

High Ability Learners
Learners work in pairs. Solve these division sentences.
1) 32 ÷ 8 =
2) 45 ÷ 5 =
3) If 9 x 8 = 72 Then 72 ÷ 9 =
4) if 12 x 4 = 48 then 48 ÷ 4 =

Assessment for Learning
Refer leaners to Learner's Book page 197 to 198 for exercise.

Suggested Home work
Solve these sentences
1) 36 ÷ 4 = ? 2) 25 ÷ 5 =?
3) 40 ÷ 8 = ? 4) 30 ÷ 2 = ?

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

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

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

Module 1: Unit fractions

Content Standard
B3.1.3.1: Develop an understanding of fractions using concrete and pictorial representations and write fractions in words and symbols

Indicator(s): 1. B3.1.3.1.1
Understand a unit fraction by explaining the fraction $\frac{1}{f}$ as the quantity obtained by taking 1 part when a whole is partitioned into *f* equal parts and that a fraction $\frac{1}{f}$ is the quantity obtained by taking a parts of the $\frac{1}{f}$ size.

Learning Expectation:
Learners can:
Identify and name unit fractions.
Make unit fractions.

Essential for Learning:
Learners need to:
be able to identify half of a whole
be able to identify part of an object as a fraction.

New Words
unit, part, half, fraction, numerator, denominator

Resources:
sheets of paper, colour pencils, apples or oranges, counters, sraws etc.

Number of Lessons 2

Starter
Play "Show me" the number 15 or 10. Pair or whole class activity to practice making groups of objects.
Call out a number
Pupils must use their counters to create a set with that number of objects and count it.

Variation –Place Value
Call out a number larger than **10**.
Pupils must use their bundles of sticks and 1s to represent that number on their desk or on a number or **10s** frame.

Find Out
Refer learners to Learner's Book page 202. Say, look at the fractions carefully. Ask: What is common about all the fractions? Elicit that they all have one part shaded. Lead the class to name the fractions.
E.g. **A** is $\frac{1}{4}$ **B** is $\frac{1}{3}$

Lesson 1: Unit fractions (1)

Let us Learn:
1. Brainstorm to come out with the meaning of a unit fraction.
2. Demonstrate how a unit fraction can be obtained. Demonstrate using an apple/ orange and a sheet of paper.
3. Put learners into groups of about six.
4. Present each group with about 2 or 3 unit
5. fractions, e.g. $\frac{1}{7}$ *or* $\frac{1}{4}$
6. Task them to demonstrate the fractions by dividing the sheet and shading one out of it.
7. Direct learners to Let us Learn on page 202 of the Learner's Book. Discuss the names of the unit fractions there.

Review

Differentiated lesson
Low ability learners
- Identify and make their own unit fractions

High ability learners
- Make a unit fraction of a group of objects. E.g. 2 is of 10 items.

Assessment: Refer learners to page 203 to 204 of the Learner's Book for exercise.

Lesson 2: Unit fractions (2)

Let us learn:
Revise previous lesson on unit fractions.
Use learners groups from previous lesson.
Present each group with straws or bottle caps.
Task each group to make a concrete demonstration of given unit fractions.
Take learners out of the class. Learners to identify count any number of any item (e.g. trees) and make a unit fraction out of it.

Review

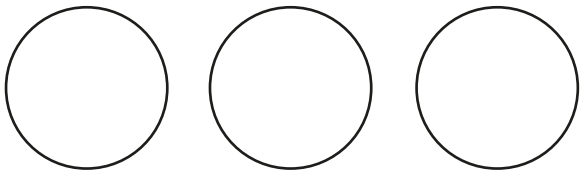
Differentiated lesson
Low ability learners
- Identify and make their own unit fractions
- Make a unit fraction of a group of objects.

E.g. 2 is $\frac{1}{5}$ of 10 items.

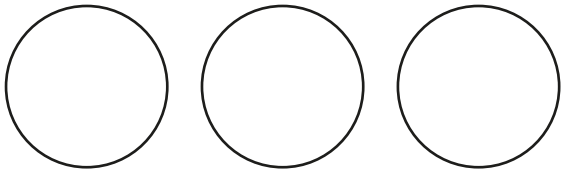
High ability learners
Tell which unit fraction is larger and explain that the larger the denominator of a unit fraction, the smaller that fraction.

Assessment: Refer learners to page 204 to 205 of the Learner's Book for exercise

Suggested Home works
Draw shapes and shade to show the following unit fractions



$\frac{1}{5}$ $\frac{1}{3}$ $\frac{1}{9}$



$\frac{1}{15}$ $\frac{1}{7}$ $\frac{1}{20}$

2. Tell which of the unit fractions is larger
e.g. $\frac{1}{3} > \frac{1}{5}$

$\frac{1}{2}$	$\frac{1}{5}$
$\frac{1}{7}$	$\frac{1}{4}$
$\frac{1}{3}$	$\frac{1}{13}$
$\frac{1}{6}$	$\frac{1}{9}$
$\frac{1}{12}$	$\frac{1}{8}$

For additional exercises on this module, refer to pages 151 - 152 of the Workbook

Module 2: Multiples of unit fractions

Content Standard
B3.1.3.1: Develop an understanding of fractions using concrete and pictorial representations and write fractions in words and symbols

Indicator(s):
1. B3.1.3.1.1 Understand a unit fraction by explaining the fraction $\frac{1}{f}$ as the quantity obtained by taking 1 part when a whole is partitioned into ***f*** equal parts and that a fraction $\frac{1}{f}$ is the quantity obtained by taking a parts of the $\frac{1}{f}$ size.

Learning Expectation:
Learners can: make unit fractions.
add multiples of unit fractions

Essential for Learning:
Learners need to:
be able to identify unit fractions
be able to make unit fractions

New Words:
unit, part, multiples, fraction

Resources:
sheets of paper, colour pencils, apples or oranges, counters, straws, number lines etc.

Number of Lessons 2

Starters:
Play "How many" (Whole class activity to practice counting objects)

Start
Ask pupils how many…
Toes they have?
Finger nails they have?
Legs they have?
Pupils are sitting on one desk?
Windows on one side of your class?
Exercise books for maths?
Continue the starter with other objects familiar to children.

Find Out
Refer learners to Learner's Book page 206. Say, look at the fractions carefully. Ask: Are they the same? Can we add the two fractions? What will be the new fraction when we add them?

Lesson 1: Multiples of unit fractions (1)

Let us Learn:
- Review pupils' knowledge on unit fraction.
- Present pupils with unit fractions and task them to demonstrate it using sheets of paper or drawing.
- Put learners into groups of about six.
- Direct learners to Let us Learn of the Learner's Book page 206. Explain and demonstrate how to make multiples of unit fractions.
- Present each group with some unit fractions and task them to add them.
  E.g. $\frac{1}{5} + \frac{1}{5} + \frac{1}{5} = \frac{3}{5}$
- Explain that when we make multiples of unit fractions and we get the same denominator and numerator it is equal to 1.

Review

Differentiated lesson
Low ability learners
- Add multiples of unit fractions.

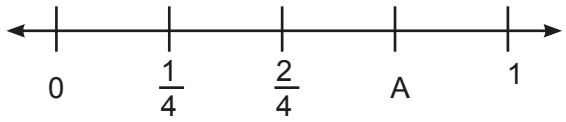
High ability learners
- Break a given non-unit fraction into several unit fractions. E.g. $\frac{3}{7} + \frac{1}{7} + \frac{1}{7} = \frac{1}{7}$

Assessment:
Refer learners to page 207 of the Learner's Book for exercise.

Lesson 2: Multiples of unit fractions (2)

Let us learn:

- Revise previous lesson on multiples of unit fractions.
- Use learners groups from previous lesson.
- Demonstrate how to use number line to add unit fractions.



- Present each group with number line sheets
- Task each group to use the number lines to represent multiples of unit fractions.

Collaborative learning.
Learners present their results to the class.
Justification of ideas

Review
Differentiated lesson

- Low ability learners

Use the number line to add unit fractions.

- High ability learners

Extend a unit fractions beyond 1 on the number line.
E.g. $\frac{1}{3}$ $\frac{1}{3}$ $\frac{1}{3}$ 1 $\frac{1}{3}$ etc.

Assessment:
Refer learners to page 208 of the Learner's Book for exercise

Suggested Home works
Fill in the missing spaces with the correct fractions

1.	$\frac{1}{5}$ $\_$ $\frac{3}{5}$ $\frac{4}{5}$ $\_$
2.	$\frac{1}{7}$ $\frac{2}{7}$ $\_$ $\_$ $\frac{5}{7}$ $\frac{6}{7}$ $\_$
3.	$\_$ $\frac{2}{6}$ $\frac{3}{6}$ $\_$ $\frac{5}{\ }$ $\frac{6}{6}$
4.	$\frac{1}{8}$ $\frac{2}{8}$ $\_$ $\frac{4}{8}$ $\frac{5}{8}$ $\frac{6}{8}$ $\_$ $\_$
5.	$\frac{1}{4}$ $\_$ $\frac{3}{4}$ $\frac{4}{4}$ $1\frac{1}{4}$ $1\frac{3}{4}$

For additional exercises on this module, refer to pages 153 - 156 of the Workbook

Module 3: Fractions of a group

Content Standard
B3.1.3.1 Develop an understanding of fractions using concrete and pictorial representations and write fractions in words and symbols

Indicator(s)
B3.1.3.1.2 Understand, explain and demonstrate that fractions can be used to represent parts of a group of objects, point on a line, or distances on a number line [Read and write fractions using words and symbols. (E.g. one-half, two halves, thirds, fifths etc.)]

Learning Expectation:
Learners can:
make fraction out of a group

Essential for Learning
Learners need to:
be able to count in 1s
be able to identify fractions of a unit

New Words
fraction, part, group

Resources
sheets of paper, colour pencils, apples or oranges, counters, straws, number lines etc.

Number of Lessons 2

Starter:
Play "How many" 10s and 1s (Whole class activity to practice place value)

Write a number between 10 and 20 on board
Pupils must identify number of groups of 10s and number of 1s in number.

2 tens and 3 ones

Find Out
Refer learners to Find Out on page 209 of the Learner's Book. Say, Look at the pictures. How many has been circled in each group? Can you say that in fraction?

Lesson 1: Fraction of a group (1)

Let us Learn:
- Review pupils' knowledge on fraction of a unit whole.
- Count six bottle caps and place it in front of the class.
- Call out two pupils to share the six bottle caps equally.
- Lead the class to write fraction names for the amount each pupil got. That is,
- Discuss with learners that since they divided the bottles cups equally between them, we can also say each had
- Direct learners to Let us Learn of the Leaner's Book page 209.
- Discuss each of the pictures with the class.
- Put learners into groups and present each group with some straws.
- Assign them fractions for them to represent using the straws.

Review

Differentiated lesson
Low ability learners
- Make fractions of a group of objects.

High ability learners
- Make different fractions from the same group of objects.

Assessment
Refer learners to page 210 of the Learner's Book for exercise.

Lesson 2: Fraction of a group (2)

Let us learn:

- Revise previous lesson on fraction out of a group.
- Use learners groups from previous lesson.
- Present each group with task sheets for them to identify the fractions. $\frac{3}{6}$
- Give each group fractions, say $\frac{3}{6}$, task learners draw and shade to represent the fraction. **Collaborative learning.**
- Learners present their results to the class. **Justification of ideas**

Review

Differentiated lesson

Low ability learners

Demonstrate a given fraction using counters/straws

High ability learners

Compare two given fractions and tell which is larger.

E.g. $\frac{3}{6}$ *is bigger than* $\frac{2}{6}$

Assessment: Refer learners to page 211 of their Learner's Book for exercise.

Suggested Home works

Draw and shade to show the following fractions

1	$\frac{2}{8}$
2	$\frac{1}{2}$ *of* 6
3	$\frac{3}{9}$
4	$\frac{1}{2}$ *of* 8
5	$\frac{2}{5}$

For additional exercises on this module, refer to pages 157 - 159 of the Workbook

Module 4: Comparing and ordering unit fractions

Content Standard
B3.1.3.1: Develop an understanding of fractions using concrete and pictorial representations and write fractions in words and symbols

Indicator(s)
B3.1.3.1.3: Compare and order unit fractions and fractions with like denominators by using concrete models, pictorial representations and number line.

Learning Expectation
Learners can:
compare and order unit fraction

Essential for Learning
Learners need to:
be able to identify unit fraction
be able to make unit fractions

New Words
fraction, order, compare

Resources
sheets of paper, colour pencils, apples or oranges, counters, straws, number lines etc.

Number of Lessons 2

Starter
Play "How many" 10s and 1s (Whole class activity to practice place value)
Write a number between 10 and 20 on board
Pupils must identify number of groups of 10s and number of 1s in number.

2 tens and 3 ones

Find Out
Refer learners to page 212 of the Learner's Book.
Say, Look at the pictures. How can we tell which of the two fractions is bigger?

Lesson 1: Comparing fractions of the same denominator

Let us Learn:
- Review pupils' knowledge on unit fractions.
- Direct learners to Let us Learn on page 212 of the Learner's Book.
- Discuss the unit fractions with learners.
- Explain that if the fractions have the same denominator, then we compare the numerators to show which of the fractions is bigger.

e.g. $\frac{2}{6}$ *is bigger than* $\frac{1}{6}$

- Pair learners. Give them task sheet with pairs of fractions with the same denominator to compare.
- Then give learners a number of fractions to compare and order.

Review

Differentiated lesson
Low ability learners
- Compare pairs of fractions.

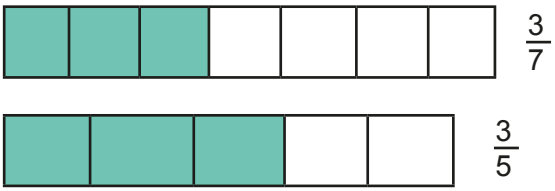
High ability learners
- Compare and order a number of fractions.

Assessment for Learning
Refer learners to page 213 of their Learner's Book for exercise.

Lesson 2: Compare fractions with different denominators

Let us learn:
Revise previous lesson on **comparing and ordering fraction with same denominators**
Demonstrate how to compare fractions with different denominators.

E.g. compare $\frac{3}{7}$ and $\frac{3}{5}$



From the diagrams,
Explain to learners that to compare fractions of different denominators, sketch the fractions making sure that the length of the shapes are the same then compare the shaded regions.

Review

Differentiated lesson
Low ability learners
- Sketch to show which of the given pairs of fractions is larger.

High ability learners
- Sketch to show which of the given pairs of fractions is larger.

Assessment for Learning
Refer learners to page 214 of the Learner's Book for exercise.

Suggested Home works
Compare these pairs of fractions

1	$\frac{2}{5}$ and $\frac{3}{4}$
2	$\frac{3}{7}$ and $\frac{1}{4}$
3	$\frac{2}{9}$ and $\frac{1}{3}$
4	$\frac{5}{8}$ and $\frac{7}{9}$
5	$\frac{2}{5}$ and $\frac{3}{7}$

Compare and order the ff. fractions

1	$\frac{3}{5}, \frac{3}{4}, \frac{1}{3}$
2	$\frac{3}{7}, \frac{1}{4}, \frac{3}{5}, \frac{1}{3}$
3	$\frac{2}{9}, \frac{1}{3}, \frac{4}{5}, \frac{2}{3}$
4	$\frac{5}{8}, \frac{7}{9}, \frac{2}{5}, \frac{3}{4}$
5	$\frac{2}{5}, \frac{1}{2}, \frac{5}{7}, \frac{3}{7}$

For additional exercises on this module, refer to pages 160 - 163 of the Workbook

Encourage learners to do the reflection exercises on page 215 after this sub-strand.

Learners complete the self-assessment table on page 216. This will help you know each learner's strength and weaknesses.

Module 1: Paying the exact amount

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

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

Learning Expectation:
Learners can:
Pay an exact amount

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

New Words:
cedi, pesewas, note, coin, change

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

Number of Lessons 2

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

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

Lesson 1: Paying the exact amount (1)

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

Review

Differentiated lesson
Low ability learners
- Learners to tell the differences in value among the cedi notes and coins.

High ability learners
- Learners to justify the differences in the various price tags

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

Lesson 2: Paying the exact amount (2)

Let us Learn:

- Create learning centres in the class. They should include;

a. A trade off centre where pupils can exchange high value notes for smaller ones in order to pay exact amount.
b. A shop/market where items are sold.

- Use learners' previous groups. **Collaborative Learning**.
- Give each group some amount of money.
- Demonstrate how you will trade off 20 cedis for smaller denominations in order to pay for an exact amount of 17 cedis.
- Set groups on task to trade off and then buy and pay exact amount.

Review

Differentiated lesson
Low ability learners

- Present learners with a cedi note and task them to exchange for smaller denominations to pay for exact amount.

High ability learners

- Present learners with a cedi note and task them to tell how much change they will take if they bought an item of less price.

Assessment for Learning
Refer learners to page 220 of the Learner's Book for exercise

Lesson 3: Paying the exact amount (3)

Let us Learn:

- Review previous lesson on paying exact amount.
- Ask groups to move out of the class to the canteen and bye items of their choice.
- Task them to record their transactions and explain it to the class when they come back.

a. Questions
b. What did you buy?
c. How much was it?
d. What combination of denominations did you use?
e. What other combinations could you have used?
f. Was there change?
g. How much was the change?

Review

Differentiated lesson
Low ability learners

- Present learners with a cedi note and task them to exchange for smaller denominations to pay for exact amount.

High ability learners

- Present learners with a cedi note and task them to tell how much change they will take if they bought an item of less price.

Assessment
Refer learners to page 220 of their learners' book for exercise

Suggested homework

- Record your transactions on items you buy at home to answer the following questions
- What did you buy?
- How much was it?
- What combination of denominations did you use?
- What other combinations could you have used?
- Was there change?
- How much was the change?

For additional exercises on this module, refer to pages 164 - 169 of the Workbook

Module 2: Taking change

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

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

Learning Expectation:
Learners can:
Buy items and take change

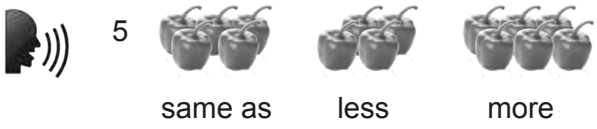
Essential for Learning:
Learners need to:
be able to exchange a bigger denomination for a smaller but equivalent denominations

New Words: cedi, pesewas, note, coin , change

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

Number of Lessons 2

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



Find Out:
Direct learners to page 222 of the Learner's Book.
Say: look at the items. **Ask:** Can you pay and take change? What denomination would you prefer to use? How much change would you take if you gave a particular denomination?

Lesson 1: Taking change (1)

Let us learn:
Review previous lesson on paying exact amount.

- Explain to pupils that sometimes we may not be able to pay exact amount. When that happens, we have to give a bigger denomination and take change.
- Display an item with a price tag and demonstrate how you can purchase the item and take change.
- Put learners into small groups of about five. **Collaborative Learning**.
- Display some items with price tags in front of each group.
- Task each group to discuss and tell the change they will take if they were buying with a particular denomination. **Justification of Ideas.**
- Direct learners to Let us Learn on page 222 of the Learner's Book. Lead the class to discuss the items and the change.

Review

Differentiated lesson
Low ability learners

- Learners to tell the change to be taken when they buy an item.

High ability learners

- Learners to tell the change to be taken when they buy an item.

Assessment for Learning
Refer learners to page 224 of the Learner's Book for exercise.

Lesson 2: Taking change (2)

Let us learn

- Create learning centres in the class. E.g. A shop/market where items are sold.
- Use learners' previous groups. **Collaborative Learning**.
- Give each group some amount of money to buy and take change.
- Engage learners to try out some calculations involving change.
  E.g. Gh¢25.50 – Gh¢10.50 = Gh¢15.00

Review

Differentiated lesson
Low ability learners

- Learners to tell the change to be taken when they buy an item.

High ability learners

- Learners to tell the change to be taken when they buy an item.

Assessment for Learning
Refer learners to page 225 of the Learner's Book for exercise.

Suggested homework
Record your transactions on items you buy at home to answer the following questions

1. What did you buy?
2. How much was it?
3. What combination of denominations did you use?
4. What other combinations could you have used?
5. Was there change?
6. How much was the change?

For additional exercises on this module, refer to pages 170 - 172 of the Workbook.

Encourage learners to do the reflection exercises on page 226 after this sub-strand.

Learners complete the self-assessment table on page 226. This will help you know each learner's strength and weaknesses.

Strand: 2

Algebra

Algebra

Module 1: Increasing and decreasing patterns

Content Standard
B3.2.1.1 Recognise, create, extend, describe, and use patterns and rules to solve mathematical tasks

Indicator:
B3.2.1.1.1 Demonstrate an understanding of increasing and decreasing patterns byextending the next two or three terms and identifying errors or missing elements.

Learning Expectation
Learners will be able to: demonstrate an understanding of increasing and decreasing patterns and identify pattern rule for a given pattern.

Essential for Learning
Learners can group objects, 2D shapes based on a given criteria.

New Words
Patterns, sequence, difference, terms

Resources
2D shapes, numeral cards

Number of Lessons 1

Starter
Play: "1 clap1: learners recite 1 clap 1, 1 clap 2, 1 clap 3 – 1 clap 9.
They recite and clap simultaneously.

Find Out
Refer learners to Find Out on page 228 of the Learner's Book. Learners work in pair and read the numbers from 86 − 61. They discuss among themselves. Are the numbers increasing or decreasing? What are the differences? Are they the same?

Lesson 1: Identifying pattern rule for a given pattern

Let us Learn
- Take learners outside the classroom. Let them form a big circle.
- They play the game 1 squat 1" up to 1 squat 9 and restart 1 squat 1.
- The first person start: 1 squat 1, the second person says 1 squat 2 and so on until they reach 1 squat 9. When they set to squat, they squat and get up to say
- Back to the classroom, learners continue these pattern

1) 1, 2, 3, 3, 2, 1, 1, 2, 3, 3, 2, 1
2) 1,9, 9, 2, 9, 9, 3-9 9 9, 4, 9, 9

- Refer to Learner's Book page 208. Go through the question with learners. 7, 10, 13, 16, 19. Learners discuss in their groups and identify the pattern, continue with 3 terms. Learners should come out with the rule. Rule: "Add 3 to the next number"
- Refer learners to the next questions. They critically look at the pattern continue with 2 terms and identify the rule. ***(critical thinking problem solving skills collaborative learning)***

Review Exercise
Continue with the next 3 terms and find the rule.

Low Ability learners:
1 2, 4, 8 ___ ___ ___
2 The rule is: _____

High Ability learners:
1 1, 4, 9, 16 ___ ____ ____
2 The rule is _____

Assessment for Learning:
Refer learner to Learner's Book page 230 for exercise.

Suggested Home Work:
Continue with 3 terms and find the rule.
1 10, 15, 20, 25 ___ ___ ___
2 30, 40, 50, 60 ____ ___ ____
3 9, 12, 15, 18 ____ ___ ___
4 Start with 88 make 5 patterns by subtracting 5 each time.

For additional exercises on this module on this module, refer to pages 174 of the Workbook

Module 2: Errors in patterns

B3.2.1.1 Recognise, create, extend, describe, and use patterns and rules to solve mathematical tasks

Indicator:
B3.2.1.1.1 Demonstrate an understanding of increasing and decreasing patterns byextending the next two or three terms and identifying errors or missing elements.

Learning Expectation
Learners will be able to: identify errors and find the missing terms in a pattern.

Essential for Learning
Learners can make patterns when given rules and can continue patterns with 2 or 3 terms.

New Words
error, sequence, previous, pattern

Resources: numeral cards, 2D shapes.

Number of Lessons 2

Lesson 1: Identifying errors in patterns

Starter:
Play: "Making 10s" Call out a number and learners add a number to make 10 and call out that number.

Find Out:
Refer learners to Learner's Book page 232. Learners study the pattern
sequence, find the rule and continue with the next term. Have learners work in pairs.
(critical thinking, collaborative Learning

Let Us Learn:
- Arrange 2D shapes on the board. Ask learners to observe
  it critically, identify the rule and what has changed the pattern.
- There is an error at the third term. Instead of square a rectangle was put there.
- Have learners copy this and identify the errors AAB, AAB, BAB, AAB. (critical thinking, collaborative learning
- Refer learners to Learner's Book page232. Go through the 2 exercise with learners. They should identify the error in question 1 and find the missing numbers in question 2.

Review Exercise

Differenciated Lessons:
Identify the error in the given patterns and find, the missing numbers. Learners must work in pairs

Low Ability Learners:
- 3, 6, 9, 10, 12,
- 10, 20, − 40 −−

High Ability Learners:
- Create your own pattern. Make an error. Let your partner identifies it.
- What is the error?
  80, 75, 70 – 60, 65

Assessment for Learning:
Refer learners to Learner's Book page 233 for exercise

Suggested Home Work:
Find the missing numbers in these patterns.
1) 66, 56, __, __, 26, __
2) 30, 43, __, __, 65, __
   Identify the errors in these patterns.
3) 60, 75, 90, 100, 115, 130, 150
4) 421, 32, 43, 63, 53, 73

Lesson 2: Creating a pattern for a given rule

Starter
Sing the song “I am counting 1”

Let Us Learn
- Have learners work in pairs.
- Write these patterns on the board. Learners identify the rule. 40, 42, 44…. Learners continue with 3 terms and find the rule. Ask learners in pairs to create their own pattern so. They exchange their work with, another group, examine the pattern and, identify the rule. Used. ***(critical thinking problem solving skills collaboration learning)***
- Refer learners to Learner's Book page 229
- “Let Us Learn 2” Learners create their own patterns. They start at 30 and add 5 to each term.
- Go through question 2 with learners. **(collaborative learning, critical thinking, attention to precision)**

Review Exercise

Differenciated lessons
Create 3 pattern with these given rules.
Work in pairs.

Low Ability Learners
- Start at 25. Add 5 to each term.
- Write 5 terms

High Ability Learners
- Subtract 6 from each term start from any number.

Assessment for Learning
Refer learners to Learner's Book page 231 for exercises.

Suggested Home Work
1. Make a pattern by adding 2 to each term. Start from any number. Make 5 terms.
2. Start from 100. Subtract 10 from each term. Make a pattern of 5 terms.
3. The rule is: add 3.
4. Use your own rule to create a 5 term pattern.

For additional exercises on this module on this module, refer to pages 177 of the Workbook.

Module 3: Increasing and decreasing pattern (100 number chart)

B3.2.1.1 Recognise, create, extend, describe, and use patterns and rules to solve mathematical tasks

Indicator:
B3.2.1.1.1 Demonstrate an understanding of increasing and decreasing patterns byextending the next two or three terms and identifying errors or missing elements.

Learning Expectation:
Learners will be able to: locate and describe increasing/decreasing patterns in 100 number chart diagonally, horizontally and vertically.

Essential for Learning:
Learners can identify errors in patterns, and can fill in missing numbers in a pattern.

New words
increasing, decreasing coloum, diagonal vertical, row, horizontal

Resources: 100 Number chart.

Number of Lessons 2

Lesson 1: Locating and describing patterns

Starter:
Have learners count by 10s up to 100 while clapping simultaneously.

Find Out:
Refer learners to page 235 of the Learner's Book. Learners work with a partner. Study the picture.
Identify what the learner is doing and write a pattern for it.

Let Us Learn:
- Learners count by 5s to 50 and count by 10s up to 100. Write the numbers on the board and ask learners to tell the class the pattern that they have identified (collaborative learning, attention to precision)
- Refer learners to Learner's Book page 235 to 237 Give each group a 100 numeral chart. Have learners work in pairs. They should study the chart and come out with at least 2 patterns.
- Now have learners study the numbers diagonally, vertically and horizontally and write their own patterns and write rules for them. ***(critical thinking, problem solving skills, collaborative learning)***
- Refer learners to Learner's Book page 236. Go through the questions with learners.

Review Exercise

Differenciated Lessons
Study the chart and write down 2 patterns 1 increasing and the other one decreasing

Suggested Home Work
1) Write five terms of pattern in an increasing order
2) Write five terms of pattern in a decreasing order.

For additional exercises on this module on this module, refer to pages 179 of the Workbook.

Encourage learners to do the reflection exercises on page 240 after this sub-strand.

Learners complete the self-assessment table on page 240. This will help you know each learner's strength and weaknesses.

Strand: 3

Geometry and measurement

Module 1: Describing solid shapes

Content Standard
B3.3.1.1: Analyse the relationships among and between 2-D shapes and 3-D objects according to a variety of attributes, including measurement

Indicator
B3.3.1.1.1: Describe 3D objects according to the shape of the faces, the number of edges and vertices. Sort regular and irregular polygons including triangles, quadrilaterals, pentagons, heptagons according to the number of sides

Learning Expectation:
Learners can:
recognize and name solid shapes, describe 3D shapes using their attributes,

Essential for Learning:
Learners need to:
have experience with identifying 3D objects and 2D shapes count in 1s up to 50

New Words
2-D shapes, 3-D shapes, faces, edges , vertices

Resources
sheets of paper, cardboard, colour pencil, 3D objects, pictures of 3D shapes, etc.

Number of Lessons 4

Starter:
Play: 22.Treasure hunt… (shapes, 3D objects)
Show pupils a 2D shape or 3D object
Pupils must find as many examples of the shape or object in the classroom (or in the school yard) as they can.

3D objects **2D shapes**

Find Out:
Direct learners to page 242 of the Learner's Book.
Say: Look at the shapes. Can you identify and name these shapes? Can you talk about their attributes?

Lesson 1: Describing solid shapes

Let us Learn:
Direct learners to the Let us Learn on page 242 of the Learner's Book.
Point to the solid shapes and drill the names with them.
Talk about objects in the classroom and their homes that have any of the 3Ds.

Collaborative Learning.
Pair learners and task them to draw any real objects that have 3D shapes.

Review

Differentiated lesson
Low ability learners
- Present learners with 3D objects to identify and name.

High ability learners
- Task learners to differentiate among 2D shapes found in the 3D objects.

Assessment for Learning
Refer learners to page 242 of their Learner's Book for exercise.

Lesson 2: Attributes of a cylinder, a cube and a cuboid

Let us learn:
- Use learners' group from previous lesson.
- Give each group a cylinder, a cube and a cuboid and some criteria to use to talk about the object.
- Task group to make presentation on their 3Ds to the class using the criteria. ***(Justification of Ideas).***

Criteria
a. name
b. flat face/curved face
c. number of faces
d. number of edges
e. number of vertices

Encourage other learners to ask questions
Task each group to cut the nets to make their own cylinder, cube and cuboid.

Review

Differentiated lesson
Low ability learners
- Present learners with a cylinder, a cube and a cuboid and criteria to describe them. Learners also identify objects that are considered cylinders, cubes or cuboid in the environment.

High ability learners
- Task learners to identify 2D shapes found in the cylinder, cube and cuboid and describe the cube using a given criteria.

Assessment for Learning
Refer learners to page 244 of the Learner's Book for exercise

Lesson 3: Attributes of a sphere and cone

Let us learn:
- Use learners' group from previous lesson.
- Give each group a sphere and a cone and some criteria to use to talk about the object.
- Task group to make presentation on their objects to the class using the criteria.
  Justification of Ideas
  Criteria
  a. name
  b. flat face/curved face
  c. number of faces
  d. number of edges
  e. number of vertices
- Encourage other learners to ask questions
- Demonstrate how to cut the net of a sphere and a cone.
- Task each group to cut the net to make their own sphere and cone.

Review

Differentiated lesson
- Low ability learners

Present learners with a sphere and a cone and criteria to describe them. Learners also identify objects that are considered spheres and cones in the environment.
- High ability learners

Task learners to identify the 2D shapes found in a sphere and a cone and describe them using a given criteria.

Assessment for Learning
Refer learners to page 245 of the Learner's Book for exercise

Lesson 4: Attributes of a Triangular pyramid and rectangular prism

Let us learn:
- Use learners' group from previous lesson.
- Give each group a triangular pyramid and rectangular prism and some criteria to use to talk about the object.
- Task each group to make a presentation on their objects to the class using the criteria.
  Justification of Ideas
a. Criteria
b. name
c. flat face/curved face
d. number of faces
e. number of edges
f. number of vertices
- Encourage other learners to ask questions
- Demonstrate how to cut the net of a triangular pyramid and rectangular prism.
- Task each group to cut the net to make their own triangular pyramid and rectangular prism.

Review

Differentiated lesson
Low ability learners
- Present learners with a triangular pyramid and rectangular prism and criteria to describe it. Learners also identify objects that are considered sphere in the environment.

High ability learners

- Task learners to identify the 2D shapes found in a triangular pyramid and rectangular prism and describe it using a given criteria.

Assessment for Learning

Refer learners to page 248 of their learners' book for exercise

Suggested homework

1. Draw and colour a triangular pyramid and a cuboid
2. Draw any two objects that have the shape of a sphere.
3. Write any two objects that have a rectangular shape.

4. Use these criteria to describe the following 3D objects

Criteria	Cone	Cylinder	Sphere	Cuboid	Cube	Triangular pyramid	Rectangular-prism
1. Corners							
2. Faces							
3. Roll/not roll							
4. number of edges							
5. number of vertices							

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

	Sphere	cylinder	cuboid	Cube
Objects	E.g. ball			

For additional exercises on this module, refer to pages 182 - 184 of the Workbook.

Module 2: Regular and irregular shapes

Content Standard
B3.3.1.1: Analyse the relationships among and between 2-D shapes and 3-D objects according to a variety of attributes, including measurement

Indicator
B3.3.1.1.1: Describe 3D objects according to the shape of the faces, the number of edges and vertices. Sort regular and irregular polygons including triangles, quadrilaterals, pentagons, heptagons according to the number of sides

Learning Expectation
Learners can:
Identify irregular shapes
Differentiate between regular and irregular shapes

Essential for Learning
Learners need to:
have experience with identifying 3D objects and 2D shapes count in 1s up to 50

New Words
regular, irregular, angles, sides

Resources: sheets of paper, cardboard, colour pencil, cut out regular and irregular shapes

Number of Lessons 2

Starter
Play: "What can you say about the shape" (2D shapes or 3D shapes)
Raise up a 2D or a 3D object
Say "What can you tell me about this shape?" (or object)
Pupils must say everything they can say about the shape or object.

The more pupils learn about shapes, objects and the relationships between them, the more they will have to say about a given shape or object.

Find Out
Direct learners to page 246 of the Learner's Book.
Say: look at the following shapes. Can you describe them using their faces, edges and vertices?

Lesson 1: Regular and irregular shapes

Let us learn:
- Direct learners to the Let us Learn on page 246 of the Learner's Book.
- Brainstorm to come out with the meaning of regular and irregular shapes.
- Explain that regular shapes are shapes with all sides equal and all angles equal. Irregular shapes do not have equal sides or equal angles.
- Show examples of regular and irregular shapes to help learners understand the meaning well.
- Raise cut out shapes. Some being regular and other being irregular for learners to identify.

Review

Differentiated lesson
Low ability learners
- Learners identify regular and irregular shapes.

High ability learners
- Learners differentiate between regular and irregular shapes.

Assessment for Learning
Refer learners to page 247 of the Learner's Book for exercise

Lesson 2: Regular and irregular shapes

Let us learn:

- Review previous lesson on regular and irregular shapes.
- Put learners into groups of about six.
- Give each group sheets of papers.
- Task them to make regular and irregular shapes
- Take learners outside the class to identify objects they consider as having regular shapes and those with irregular shapes.

Review

Differentiated lesson
Low ability learners

- Learners identify regular and irregular shapes.

High ability learners

- Make regular and irregular shapes to compare

Assessment for Learning
Refer learners to page 251 of the Learner's book for exercise.

For additional exercises on this module, refer to pages 185 - 187 of the Workbook.

Module 3: Angles

Content Standard:
B3.3.1.1: Analyze the relationships among and between 2-D shapes and 3-D objects according to a variety of attributes, including measurement

Indicator:
B3.3.1.1.2: Draw and identify angles

Learning Expectation:
Learners can:
identify angles in objects draw angles

Essential for Learning:
Learners need to:
have experience with identifying 3D objects and 2D shapes
have experience with drawing plane and solid shapes

New Words
angles, trapezium, kite, irregular

Resources
sheets of paper, ruler, colour pencil, cut out regular and irregular shapes

Number of Lessons 2

Starter
Play: "What can you say about the shape" (2D shapes or 3D shapes)

Raise up a 2D or a 3D object
Say "What can you tell me about this shape?" (or object)
Pupils must say everything they can say about the shape or object.

The more pupils learn about shapes, objects and the relationships between them, the more they will have to say about a given shape or object.

Find Out
Direct learners to page 249 of the Learner's Book.
Say: look at the following shapes. What are these shapes? Can you identify the angles in the shapes?

Lesson 1: Angles (1)

Let us learn:

- Direct learners to the Let us Learn on page 249 of the Learner's Book.
- Brainstorm on the meaning of an angle. Explain to learners that an angle is formed when two lines meet.
- Pair learners and task them to draw two meeting lines and observe what they see.
- Take learners out of the classroom to identify angles in some real objects.

Review

Differentiated lesson
Low ability learners
- Learners identify angles in shapes and real objects.

High ability learners
- Learners identify angles in shapes and real objects.

Assessment for Learning
Refer learners to page 250 of the Learner's Book for exercise.

Lesson 2: Angles (2)

Let us learn:
- Revise previous lesson on angles.
- Put learners into groups. Present them with drawings of the various plane shapes on sheets of paper.
- Discuss the number of angles in the shapes. Explain that a square and a rectangle both have four angles. A triangle has three angles.
- Also, discuss angles with equal and unequal angles. Some shapes have

all angles equal. For example; square, rectangle, rhombus, etc. Some shapes have unequal angles. Example; trapezium, kite, and all irregular shapes.

- Lesson 2: Angles that are rightangles.
- Put learners into groups. Present them with tables to complete and present their results to the class.

Shapes	Number of angles	Equal or unequal angles
Square		
Rectangle		
Triangle		
Hexagon		
Kite		
Rhombus		

Review

Differentiated lesson
Low ability learners

- Learners identify number of angles in a given shape and tell whether they have equal or unequal angles.

High ability learners

- Learners identify number of angles in a given shape and tell whether they have equal or unequal angles.

Assessment for Learning
Refer learners to page 254 of the Learner's Book for exercise

Suggested homework

1) Complete the table.

Shapes	Number of angles	Equal or unequal angles
Square_		
Rectangle		
Triangle		
Hexagon		
Kite		
Rhombus_		

2) Draw two shapes of your choice and identify the angles in it

For additional exercises on this module, refer to pages 188 - 189 of the Workbook

Module 4: Angles that are right angles

Content Standard:
B3.3.1.1: Analyze the relationships among and between 2-D shapes and 3-D objects according to a variety of attributes, including measurement

Indicator:
1B3.3.1.1.3: Use cut-out paper as a square corner to determine angles which are right angles and angles which are not right angles
2. B3.3.1.1.4 Use attributes to recognize rhombuses, parallelograms, trapezoids, rectangles, and squares as examples of quadrilaterals and draw examples of quadrilaterals that do not belong to any of these subcategories

Learning Expectation
Learners can:
identify angles that are right angles and those that are not
make right angles using paper cut outs.

Essential for Learning:
Learners need to:
have experience with identifying angles in 3D objects and 2D shapes

New Words: angles • right angles

Resources: sheets of paper, ruler, colour pencil, cut out regular and irregular shapes

Number of Lessons 2

Starter
Play: "Who am I? (Whole class activity for identifying 2D or 3D objects by their features)

Put shapes on the board (triangles, squares, rectangles, circles) or a collection of 3D objects in front of pupils.
Give pupils simple clues, in everyday language, for example:
I have pointy corners
I have 3 sides etc.
Pupils have to identify mystery shape or 3D object.

Find Out
Direct learners to page 252 of the Learner's Book.
Say: look at the following angles. What can you say about the two angles?

Lesson 1: Angles that are right angles (1)

Let us learn
Revise previous lessons on angles.
Direct learners to the Let us Learn on page 252 of the Learner's Book.
Brainstorm on the meaning of a right angle.
Explain to learners that right angles are angles that are formed by two perpendicular lines.
They make angle 90°.
Use cut-out paper as a square corner to demonstrate angles which are right angles and angles which are not right angles
Pair learners and task them to use paper cut out to make right angles.

Review

Differentiated lesson
Low ability learners
- Learners identify angles that are right angles and those that are not.

High ability learners
- Learners explain that right angles are angles that are formed by two perpendicular lines. They make angle 90°.

Assessment for Learning
Refer learners to page 254 of the Learner's Book for exercise.

Lesson 2: Angles that are right angles (2)

Let us learn:
- Revise previous lessons on right angles.
- Take learners out of the class to identify right angles in real objects.
- Task learners to draw shapes that have right angles.

Review

Differentiated lesson
Low ability learners
- Learners identify angles that are right angles and those that are not.

High ability learners
- Learners explain that right angles are angles that are formed by two perpendicular lines. They make angle 90°.

Assessment for Learning
Refer learners to page 257 of the Learner's Book for exercise

Suggested Homework
Draw any two real objects and show the right angles in it

For additional exercises on this module, refer to pages 190 - 191 of the Workbook

Module 5: Quadrilaterals

Content Standard
B3.3.1.1: Analyze the relationships among and between 2-D shapes and 3-D objects according to a variety of attributes, including measurement

Indicator:
1. B3.3.1.1.3 Use cut-out paper as a square corner to determine angles which are right angles and angles which are not right angles
2. B3.3.1.1.4 Use attributes to recognize rhombuses, parallelograms, trapezoids, rectangles, and squares as examples of quadrilaterals and draw examples of quadrilaterals that do not belong to any of these subcategories

Learning Expectation:
Learners can:
identify shapes that are considered quadrilaterals sort quadrilaterals into sub-groups

Essential for Learning
Learners need to:
have experience with identifying plane and solid shapes.

New Words
quadrilaterals, four − sided, figure, parallel

Resources
sheets of paper, ruler, colour pencil, drawings of quadrilaterals

Number of Lessons 2

Starter
Play: "Who am I? (Whole class activity for identifying 2D or 3D objects by their features)

Put shapes on the board (triangles, squares, rectangles, circles) or a collection of 3D objects in front of pupils.
Give pupils simple clues, in everyday language, for example:
I have pointy corners
I have 3 sides etc.
Pupils have to identify mystery shape or 3D object.

Find Out
Direct learners to page 255 of Learner's Book.
Say: look at the following shapes. What can you say about them?

Lesson 1: Quadrilaterals (2)

Let us learn:
- Direct learners to the Let us Learn on page 255 of the Learner's Book.
- Brainstorm on the meaning of quadrilaterals. Explain to learners that Parallelograms are four sided figures with opposite sides parallel.
- Put learners into groups and present them with task sheet containing quadrilaterals and non-quadrilaterals.
- Task learners to sort out the shapes into quadrilaterals and non-quadrilaterals.

Review

Differentiated lesson
Low ability learners
- Learners to sort out the shapes into quadrilaterals and non-quadrilaterals.

High ability learners
- Learners to justify shapes that are quadrilaterals and those that are not quadrilaterals.

Assessment for Learning
Refer learners to page 256 of the Learner's Book for exercise.

Lesson 2: Quadrilaterals (2)

Let us learn:
- Revise previous lesson on quadrilaterals
- Put learners into groups and task them to draw quadrilaterals and non-quadrilaterals and colour them.
- Refer learners to page 254 of the Learner's Book. Go through the activities with learners.

Review

Differentiated lesson
Low ability learners
- Learners draw quadrilaterals and non-quadrilaterals.

High ability learners
- Learners draw quadrilaterals and non-quadrilaterals.

Assessment for Learning
Refer learners to page 262 of the Learner's Book for exercise.

Suggested homework
Draw three quadrilaterals and two non-quadrilaterals

For additional exercises on this module, refer to pages 192 - 194 of the Workbook

Encourage learners to do the reflection exercises on page 258 after this sub-strand.

Learners complete the self-assessment table on page 259. This will help you know each learner's strength and weaknesses.

Module 1: Positioning

Content Standard:
B3.3.2.1 Demonstrate that the length of an object does not change with its placement or direction

Indicator:
B3.3.2.1.1 Represent whole numbers as distances from any given location on a number line.

Learning Expectation:
Learners can:
tell that two of more shapes are the same irrespective of their orientation.

Essential for Learning:
Learners need to:
have experience with identifying 2Ds and 3Ds

New Words:
position • length • location

Resources:
water bottles, pencils, sticks, pictures of 2D shapes in different orientations.

Number of Lessons 2

Starter:
Play: Which is smaller (or larger? (Whole class, pair or individual activity to develop Understanding of relationships between quantities or numbers

Write 2 numbers on board
Pupils work with a partner to identify and prove (using counters or other means) which of the two numbers is smaller (or larger)

Find Out
Direct learners to page 260 of the Learner's Book.
Say: Look at the shapes carefully. What can you say about them? Are they of the same height? Is any of them the longest? Why do you say so?

Lesson 1: Positioning (1)

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.
- Pair learners and task them to demonstrate it to themselves.
- Put learners into small groups of about 5 or 7.
- Present them with a drawings of different 2D shapes in different orientations.
- Task learners to identify shapes that are the same.

Review

Differentiated lesson
Low ability learners
- Learners to identify two objects are of the same length irrespective of their position.

High ability learners
- Task learners to demonstrate that two items are of the same length irrespective of the orientation.

Assessment for Learning
Refer learners to page 261 of the learner's Book for exercise

Lesson 2: Positioning (2)

Let us learn:
- Revise previous lesson on positioning.
- Direct learners to let's learn in the learner's textbook.
- Discuss, using the number line, how we can show that the length of an item does not change irrespective of its position on the number line.
- Pair learners and task them to draw number lines and use it to demonstrate that the length of an object does not change irrespective of its position.
- Refer learners to Learner's Book page 259. Go through the activities with learners.

Review

Differentiated lesson

- Low ability learners

Learners to identify two objects are of the same length irrespective of their position on the number line.

- High ability learners

Task learners to demonstrate that two items are of the same length irrespective of the position on the number line.

Assessment for Learning

Refer learners to page 266 of their learners' book for exercise

For additional exercises on this module, refer to pages 195 - 196 of the Workbook

Encourage learners to do the reflection exercises on page 263 after this sub-strand.

Learners complete the self-assessment table on page 263. This will help you know each learner's strength and weaknesses.

Module 1: Measurement of length

Content Standard:
B3.3.3.1: Demonstrate an understanding of a metre and centimetre (cm, m) units for measuring length

Indicator:
B3.3.3.1.1: Model and describe the relationship between the units metre and centimeter.

Learning Expectation
Learners can:
measure the length of objects.

Essential for Learning:
Learners need to:
be able to count in 1s
Compare objects.

New Words
length, meter, centimeter

Resources
ruler, pencils, paper clips, straws, colour pencils etc.

Number of Lessons 2

Starter
Play: "Doubles" (to 12)

Call out a number between 0 and 5, for example 4.
Children must call out the double (2x) of that number, in this case 8.
The aim of the game is to develop speed-so move quickly from one number to the other

Find Out
Direct learners to "Find Out" in page 264 of Learner's Book.
Say: Look at the illustration. How many paper clips would make up the pencil? If one paper clip is 1cm, how many centimeters will the pencil measure?

- Refer learners to Learner's Book page 264. Go through the activities with them

Review

Differentiated lesson
Low ability learners
- Learners to measure a given length using ruler.

High ability learners
- Learners to measure a given length using ruler.

Assessment for Learning
Refer learners to page 265 of the Learner's Book for exercise.

Lesson 1: Measurement of length (1)

Let us Learn:
- Put learners into groups of about five.
- Give each group a measuring rule.
- Task the groups to discuss the features of the ruler.
- Demonstrate how to use a ruler to measure length correctly.
- Explain to learners that to measure accurately, put the zero (0) mark at the very tip of the object and read the number of units in the length of the objects.
- Pair learners and assign them to measure a given length. **Collaborative learning.**

Lesson 2: Measurement of length (2)

Let us Learn:
- Review lesson on appropriate use of ruler.
- Put learners into groups of about five. **Collaborative learning.**
- Give each group a measuring rule.
- Also, give them some items (exercise book, pencil, straws, etc.)
- Task learners to measure length of the items and record the results.
- Allow groups time to present their results to class.

Review

Differentiated lesson

- Low ability learners
- Learners to measure a given length using ruler.
- High ability learners
- Learners to measure a given length using ruler.

Assessment for Learning

Refer learners to page 265 of the Learner's Book for exercise

Suggested homework

a) Measure the following lengths

3cm
5cm
8cm
12cm
15cm

b) Measure the length of any five items at home and record the results.

For additional exercises on this module, refer to pages 197 - 198 of the Workbook

Module 2: Measurement of lenght (relationship between cm and m)

Content Standard:
B3.3.3.1: Demonstrate an understanding of a metre and centimetre (cm, m) units for measuring length

Indicator
B3.3.3.1.1: Model and describe the relationship between the units metre and centimeter.

Learning Expectation
Learners can: measure in centimetres and its equivalent metres.

Essential for Learning:
Learners need to:
measure the lengths of objects using a ruler.

New Words
length, meter, centimeter

Resources
ruler, pencils, paper clips, straws, colour pencils etc.

Number of Lessons 2

Starter
Play: "Doubles" (to 12)
Call out a number between 0 and 5, for example 4.
Children must call out the double (2x) of that number, in this case 8.
The aim of the game is to develop speed-so move quickly from one number to the other

Find Out:
Direct learners to "Find Out" on page 267 of Learner's Book.
Say: look at the picture carefully. How many of your ruler can measure the length of the piece of land? Can we use another measuring instrument to measure? How many centimeters will make the length? Can we measure in a different unit?

Lesson 1: Measurement of length (relationship between cm and m) (1)

Let us Learn:
- Review the previous lesson on measuring length with a ruler.
- Discuss the picture with the class. Explain to them that sometimes the length of the objects we measure are too large. So, we cannot measure it in centimeters.
- Put learners into groups of about five.
- Give each group a centimeter rule and a metre rule.
- Task the groups measure 100cm on the floor and mark it.
- Then they should measure the 100cm mark using a 1 metre rule.
- Brainstorm to come out with the concept that 100cm = 1m. **Collaborative learning.**
- Task learners to measure 2m and mark it. Then measure the marked length in cm.
- Help learners to realize that every 10cm is 1m.
- Refer learners to Learner Book page 266. Go through the activities with them.

Review

Differentiated lesson
Low ability learners
- Learners measure length in cm and in m and tell how many metres in centimetres and vice versa.

High ability learners
- Learners to convert cm into m without measuring and vice versa.

Assessment
Refer learners to page 268 of the Learner's Book for exercise.

Lesson 2: Measurement of length (relationship between cm and m) (2)

Let us Learn:

- Review lesson relationship between m and cm.
- Put learners into groups of about five. **Collaborative learning.**
- Give each group a metre rule and a centimetre rule.
- Assign them some items to measure in metres and then in centimetres and compare the results.
- Direct learners to let's learn.
- Discuss the examples on conversion of m to cm.
- Pair learners and give them some examples to try.

Review

Differentiated lesson
Low ability learners

- Learners to convert m to cm and vice versa by measuring.

High ability learners

- Learners to convert m to cm and vice versa without measuring.

Assessment for Learning
Refer learners to page 270 of the Learner's Book for exercise

For additional exercises on this module, refer to pages 199 - 200 of the Workbook

Module 3: Measurement of length (relationship between cm and m)

Content Standard
B3.3.3.1: Demonstrate an understanding of a metre and centimetre (cm, m) units for measuring length

Indicator:
B3.3.3.1.1: Model and describe the relationship between the units metre and centimeter.

Learning Expectation:
Learners can:
measure in centimetres and its equivalent metres.

Essential for Learning:
Learners need to:
measure lengths in cm and m.

New Words:
length, meter, centimeter

Resources:
ruler, colour pencils etc.

Number of Lessons 1

Starter
Play: "Doubles" (to 12)

Call out a number between 0 and 5, for example 4.
Children must call out the double (2x) of that number, in this case 8.
The aim of the game is to develop speed-so move quickly from one number to the other

Find Out
Direct learners to "Find Out" on page 269 of the Learner's Book.

Say: Look at the two objects. Can you measure their lengths using your ruler? Can you measure the length of the tennis court in centimeters?

Lesson 1: Measurement of length (relationship between cm and m)

Let us Learn:
- Review the previous lesson on converting m to cm and vice versa.
- Discuss the picture with the class. Explain to them that we measure the length of large objects in meters. The length of the school compound should not be measures in centimetres because the values will be too large.
- Put learners into groups of about five.
- Task them to discuss and write items that can be measured in cm and those that can be measured in m. **Collaborative learning.**
- Allow groups time to present their result and justify their results. **Justification of ideas**
- Refer learners to page 268 of Learner's Book. Go through activities with them.

Review

Differentiated lesson
Low ability learners
- Learners name items that can be measured in cm and those in m.

High ability learners
- Learners name items that can be measured in cm and those in m.

Assessment of Learning
Refer learners to page 270 of the Learner's Book for exercise.

For additional exercises on this module, refer to pages 201 of the Workbook

Module 4: Perimeter

Content Standard
B3.3.3.1: Demonstrate an understanding of a metre and centimetre (cm, m) units for measuring length

Indicator
B3.3.3.1.3: Estimate lengths, heights and perimeter of regular and irregular shapes using referents and verify by measuring, using a ruler or tape.

Learning Expectation:
Learners can:
measure in centimetres and its equivalent metres.

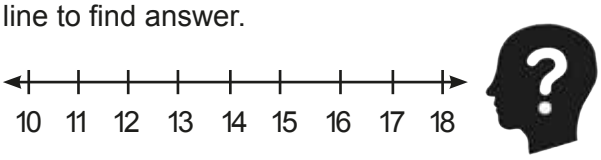
Essential for Learning:
Learners need to:
measure lengths in cm and m.

New Words:
estimate, lengths, heights, perimeter, regular ,irregular

Resources:
ruler, tiles, exercise books, colour pencils etc.

Number of Lessons 3

Starter
Play: Guess my number (whole class activity)
Give pupils hints about a number, eg: it has a **3** in the tens place…the number in the ones place is smaller than **4**.
Pupils must look and identify possible number, based on clues. Allow pupils to look at number line to find answer.



Find Out
Direct learners to "Find Out" on page 271 of Learner's Book.
Say: Look at the two objects. Can you measure their lengths using your ruler? Can you measure the length of the tennis court in centimeters?

Lesson 1: Perimeter of regular shapes (1)

Let us learn:
- Review the previous lesson on measuring lengths in cm and m.
- Brainstorm to bring out the meaning of perimeter. Explain that to measure the perimeter of shapes, we first measure the lengths of all the sides and sum them.
- Demonstrate how the perimeter of an exercise book or the top of a learner's table can be measured.
- Put learners into groups. Assign each group an item and task them to measure its perimeter.
- Call up groups to present their results with reasons.
- Refer learners to Learner's Book page 271. Go through the activities with them.

Review

Differentiated lesson
Low ability learners
- Learners measure the perimeter of items.

High ability learners
- Learners measure the perimeter of items.

Assessment
Refer learners to exercise 1 on page 272 of the Learner's Book.

Lesson 2: Perimeter of regular shapes (2)

Let us learn:
- Review the previous lesson on measuring perimeter.
- Direct learners to Let us Learn on page 272 of the Learner's Book.
- Discuss the example on how to calculate the perimeter of a given regular shape.
- Put learners into groups and assign them some examples of regular shapes to work out the perimeter.

- Call out some learners to present their answers on the board and explain their answers.

Review

Differentiated lesson
Low ability learners
- Learners measure the perimeter given regular shapes.

High ability learners
- Learners measure the perimeter given regular shapes.

Assessment for Learning
Refer learners to exercise 2 on page 272 of the Learner's Book.

Lesson 3: Perimeter of irregular shapes

Let us learn:
- Review the previous lesson on measuring perimeter of irregular shapes.
- Direct learners to Let us Learn on page 271 of the Learner's Book.
- Discuss the example on how to calculate the perimeter of a given irregular shape.
- Put learners into groups and assign them some examples of irregular shapes to work out the perimeter.
- Call out some learners to present their answers on the board and explain their answers.

Review

Differentiated lesson
Low ability learners
- Learners measure the perimeter given irregular shapes.

High ability learners
- Learners measure the perimeter given irregular shapes.

Assessment for Learning
Refer learners to page 273 of the Learner's Book for exercise.

For additional exercises on this module, refer to pages 202 - 204 of the Workbook

Module 5: Measurement of Mass (relationship kilogram and gram; litres and millitres

Content Standard:
B3.3.3.2: Demonstrate an understanding of kilogram and gram (Kg, g) unit for measuring mass and millilitre and litre (ml, l) for measuring capacity

Indicator:
B3.3.3.2.1: Model and describe the relationship between the units Kilogram and gram as well as litres and millilitres

Learning Expectation:
Learners can:
Measure the mass of objects. Measure the mass of objects in grams and kilograms.

Essential for Learning:
Learners need to be able to compare and order the mass of objects.

New Words
kilogram, gram, litres, millilitres

Resources
pencils, a bag of soil, a bowl of water, a mug, a bottle of water (1 and 0.5 litre bottles) etc.

Number of Lessons 4

Starter:
Play: "Race to 100"
Have pupils put 10 bundles of 10s and 10 ones on their desk, as their place value mats.

Call out a number between 1 and 10, for example 6. Pupils must put that many sticks or straws on their place value mat.
Call out another number between 1 and 10. Pupils must add that number of sticks or sticks to the sticks or straws on their place value mat. If they end up with more than 9 ones in the bundles in the 10s place.

Continue calling out numbers for pupils to add to their mat until they end up with 99 on their mat.

Find Out:
Direct learners to "Find Out" on page 274 of the Learner's Book.
Say: look at the picture carefully. Which pair is heavier?

Lesson 1: Measuring mass

Let us learn:
- Review the previous lesson on comparing and ordering mass.
- Direct learners to Let us Learn on page 274 of the Learner's Book.
- Explain to learners that we measure the mass of items in grams and kilograms. We use grams for items that do not weigh much. Like a small bag of rice. We measure a bag of cement in Kilograms.
- Discuss the picture with the class.
- Demonstrate how to measure the mass of objects with a scale.
- Put learners into groups and task them to measure the mass of items.
- Learners record their results for class presentation.

Review

Differentiated lesson
Low ability learners
- Learners measure mass of given items using scale.
-

High ability learners
- Learners measure mass of given items using scale.

Assessment for Learning
Refer learners to page 276 of the Learner's Book for exercise.

Lesson 2: Measuring mass (relationship between grams and kilograms)

Let us learn:
- Review the previous lesson on measuring mass.
- Explain (We use grams for items that do not weigh much. Like a small bag of rice. We measure a bag of cement in Kilograms)

and demonstrate with examples the relationship between grams and kilograms.
- Brainstorm and discuss the relationship between grams and kilograms. Explain that 1000g = 1kg
- Put learners into groups and assign them some examples to work out.

Items	Grams	kilograms
Rice	2000	2
Bottled water	1500	1.5

Review

Differentiated lesson
Low ability learners
- Learners convert g to kg and vice versa.

High ability learners
- Learners convert g to kg and vice versa.

Assessment for Learning
Refer learners to page 277 of the Learner's Book for exercise

Lesson 3: Measuring volume (relationship between litres and millilitres) (1)

Let us learn
- Review the previous lesson on measuring mass.
- Explain to learners that we measure volume in litres and millilitres. We use litres for items that weigh much. We measure huge volumes in millilitres.
- Demonstrate how to measure the volume of objects with a calibrated container.
- Put learners into groups and task them to measure volume.
- Learners record their results for class presentation.

Review

Differentiated lesson
Low ability learners
- Learners measure volume.

High ability learners
- Learners measure volume.

Assessment for Learning
Refer learners to page 276. of the Learner's Book for exercise

Lesson 4: Measuring volume (relationship between litres and millilitres) (2)

Let us learn:
- Review the previous lesson on measuring volume.
- Explain (We use millilitres for items that do not weigh much. We measure volume of large amount in litres) and demonstrate with examples the relationship between litres and millilitres.
- Brainstorm and discuss the relationship between litres and millilitres.
  Explain that 1000ml = 1l
- Put learners into groups and assign them some examples to work out.

Items	millilitres	litres
A gallon of kerosene	2000	2
Bottled water	3500	3.5

Review

Differentiated lesson
Low ability learners
- Learners convert ml to l and vice versa.

High ability learners
- Learners convert ml to l and vice versa.

Assessment for Learning
Refer learners to page 278 of their learners' book for exercise

For additional exercises on this module, refer to pages 205 - 206 of the Workbook.

Module 6: Estimate mass and volume

Content Standard:
B3.3.3.2: Demonstrate an understanding of kilogram and gram (Kg, g) unit for measuring mass and millilitre and litre (ml, l) for measuring capacity

Indicator:
B3.3.3.2.2: Estimate masses and volumes using referents and verify by measuring, using a pan balance and weights, calibrated measuring cans.

Learning Expectation:
Learners can:
estimate weights and volumes using direct or indirect comparisons
Measure the weights and volumes using standard measure.

Essential for Learning:
Learners need to:
Measure mass and volume of substances using standard unit of measure.

New Words:
estimate • masses • volumes • referents

Resources: pencils, a bag of soil, a bowl of water, a mug, a bottle of water (1 and 0.5 litre bottles) etc.

Number of Lessons 4

Starter
Play: "63. Guess how many…
(group activity)"

Place a large group of objects in front of the pupils, where everyone can see (a collection of pencils, stones, matches, etc.) or ask pupils to guess how many legs are in the classroom or how many pockets there are, in all , in everyone's clothing.

Write predictions on board then have pupils count objects together, out loud. Ask pupils who has closes estimates to explain strategy they used.

Find Out
Direct learners to "Find Out" in page 278 of the Learner's Book.
Say: look at the picture carefully. Which of the two would weigh more?

Lesson 1: Estimate mass and volume (1)

Let us learn:
- Review the previous lesson on mass and volume.
- Direct learners to Let us Learn on page 279 of the Learner's Book.
- Explain to learners that the mass of the big goat could be twice the mass of the small goat. We should be able to estimate the mass of a sheep if we know the mass of the big goat.
- Put learners into groups.
- Give each group two items of different weight.
- Task learners to first tell which of the two object weighs more. Learners must justify how they figured it out and why they say so. ***Collaborative learning, critical thinking, justification of ideas.***
- Learners must then measure the weight of one of the objects, then estimate that of the other object by comparing it with the one they have measured. **Collaborative *learning, critical thinking, justification of ideas.***
- Learners must then verify their estimate by measuring.
- Learners record their results for class presentation.
- Refer to Learner's Book page 278. Go through the activities with them
- Refer to Learner's Book page 278. Go through the activities with them

Review

Differentiated lesson
Low ability learners
- Learners estimate then verify by measuring.

High ability learners
- Learners estimate then verify by measuring.

Assessment for Learning
Refer learners to page 279 of the Learner's Book for exercise

Lesson 2: Estimate mass and volume (2)

Let us learn:
- Review the previous lesson on estimating mass and measuring to verify.
  REPEAT ACTIVITIES USING DIFFERENT ITEMS
- Use learners' previous groups.
- Give each group two items of different weight.
- Task learners to first tell which of the two object weighs more. Learners must justify how they figured it out and why they say so. ***Collaborative learning, critical thinking, justification of ideas.***
- Learners must then measure the weight of one of the objects, then estimate that of the other object by comparing it with the one they have measured. ***Collaborative learning, critical thinking, justification of ideas.***
- Learners must then verify their estimate by measuring.
- Learners record their results for class presentation.

Review

Differentiated lesson
Low ability learners
- Learners estimate then verify by measuring.

High ability learners
- Learners estimate then verify by measuring.

Assessment for Learning
Refer learners to page 250 of the Learner's Book for exercise

Lesson 3: Estimate mass and volume (3)

Let us learn:
- Review the previous lesson on volume.
- Direct learners to let's learn in learner's book.
- Explain to learners that five of the small cups will make the large cup. If there is a bigger cup, we can estimate now many of the big cup can fill it.
- Put learners into groups.
- Give each group two containers of different sizes (volume).
- Task learners to first tell which of the two containers holds more. Learners must justify how they figured it out and why they say so. **Collaborative learning, critical thinking, justification of ideas.**
- Learners must then measure with the two containers by filling one and pouring the content into the other to verify which of the two containers actually holds more. **critical thinking, justification of ideas**
- Given another container, learners must estimate the volume of the new container then verify by filling it with water and pouring it into a calibrated container. **Collaborative learning, critical thinking, justification of ideas.**
- Learners record their results for class presentation.

Review

Differentiated lesson
Low ability learners
- Learners estimate volume then verify by measuring.

High ability learners
- Learners estimate volume then verify by measuring.

Assessment for Learning
Refer learners to page 281 of the Learner's Book for exercise

Lesson 4: Estimate mass and volume (4)

Let us learn:
- Review the previous lesson on estimating volume and measuring to verify.
  REPEAT ACTIVITIES USING DIFFERENT ITEMS
- Use learners' previous groups.
- Give each group two containers of different sizes (volume).
- Task learners to first tell which of the two containers holds more. Learners must justify how they figured it out and why they say so. Collaborative learning, critical thinking, justification of ideas.

- Learners must then measure with the two containers by filling one and pouring the content into the other to verify which of the two containers actually holds more. critical thinking, justification of ideas
- Given another container, learners must estimate the volume of the new container then verify by filling it with water and pouring it into a calibrated container. Collaborative learning, critical thinking, justification of ideas.
- Learners record their results for class presentation.

Review

Differentiated lesson
Low ability learners
- Learners estimate volume then verify by measuring.
-

High ability learners
- Learners estimate volume then verify by measuring.

Assessment for Learning
Refer learners to page 282 of the Learner's Book for exercise

Suggested homework
1) Complete the table

Item	grams	kilograms
1. Rice	-------	1.5
2. Gari	5000	------
3. Cement	-----	52
4. A box of soap	2000	------

2) Complete the table

Item	millilitres	litres
1. A gallon of water	-------	2
2. A bowl of water	1000	------
3. A bottle of coke	-----	5.5
4. A tank of turpentine	2500	------

For additional exercises on this module, refer to pages 207 - 208 of the Workbook

Module 7: Measurement of time

Content Standard:
B3.3.3.3: Demonstrate an understanding of time taken by events in days, weeks and months

Indicator:
B3.3.3.3.1: Use arbitrary units to measure time taken to complete simple events.

Learning Expectation:
Learners can:
Estimate the time it takes to complete simple events.

Essential for Learning:
Learners need to:
be able describe simple events as; it takes a long or short time to complete it.

New Words:
time, arbitrary, units, events

Resources:
clock

Number of Lessons 2

Starter:
Play: "Find the mystery day (or date)"

Display a calendar for the month or year
Give pupils a start day, for example the **3rd of September**, as well as a clue, for example the mystery day (or date) is the first Thursday after this date

Pupils must find the mystery day (or date) on the calendar.

September 2019

SUN	MON	TUE	WED	THU	FRI	SAT
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28

Find Out:
Direct learners to "Find Out" in page 283 of the Learner's Book.
Say: Look at the hour glass. **Ask**: Can you tell some of the activities that it would take to complete half of the sand?

Lesson 1: Measurement of time (1)

Let us Learn:
- Direct learners to Let us Learnon page 283 of the Learner's Book.
- Discuss the estimated time it takes to complete the activities. E.g. "it takes about 1 and a half hours to play a game of football". But it takes about 6minutes to brush our teeth.
- Put learners into groups and present each group with a task sheet.
- Task each group to discuss the activities/ events on the task sheet and estimate the time it takes to complete the activities. **Collaborative Learning**.
- Call groups to tell the class what they agreed on.

Review

Differentiated lesson
Low ability learners
- Learners tell the estimated time it takes to complete given activities.

High ability learners
- Learners tell the estimated time it takes to complete given activities.

Assessment for Learning
Refer learners to page 284 of the Learner's Book for exercise.

Lesson2: Measurement of time (2)

Let us Learn:

- Review previous lesson on estimating time.
- Use learners groups from previous lesson.
- Call groups to take turns to role play a short activity, say: brushing of teeth, whiles the class time the activity. **Collaborative Learning**.
- Have a whole class discussion on activities and estimated time it takes to complete those activities.
- Also, discuss some activities that have a standard time that it takes to complete. E.g. School hours, break time, football match, etc.

Review

Differentiated lesson

Low ability learners

- Learners tell the estimated time it takes to complete given activities.

High ability learners

- Learners tell the estimated time it takes to complete given activities.

Assessment of Learning

Refer learners to page 285 of the Learner's Book for exercise

Suggested homework

1) Suggests activities that will make use of the given amount of time.

Activity/event	Estimated time
1. Eating a ball of kenkey	
2. Brushing your teeth	
3. Washing a pair of boots	
4. Walking from the classroom to the library	
5. Running around the school block once	

2) Write any four activities that you do at home and give the estimated time it takes to complete the activities.

Activity/event	Estimated time

For additional exercises on this module, refer to pages 209 - 210 of the Workbook

Module 8: Measurement of time (2)

Content Standard:
B3.3.3.3: Demonstrate an understanding of time taken by events in days, weeks and months

Indicator:
B3.3.3.3.1: Use arbitrary units to measure time taken to complete simple events.

Learning Expectation:
Learners can:
Find the duration an activity lasts.

Essential for Learning:
Learners need to:
be able describe simple events and the time it takes to complete.

New Words:
time, arbitrary, units, events

Resources:
clock

Number of Lessons 1

Starter:
Play: "Find the mystery day (or date)"

Display a calendar for the month or year
Give pupils a start day, for example the **3rd of September**, as well as a clue, for example the mystery day (or date) is the first Thursday after this date

Pupils must find the mystery day (or date) on the calendar.

September 2019

SUN	MON	TUE	WED	THU	FRI	SAT
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21

Find Out
Direct learners to "Find Out" on page 286 of the Learner's Book.
Say: Look at the hour glass. **Ask**: Can you tell how many minutes it takes to complete any of the activities?

Lesson 1: Measurement of time

Let us Learn:
- Direct learners to Let us Learn on page 287 of the Learner's Book.
- Discuss the table on "how long" it takes to complete events.
- Put learners into groups and present each group with a task sheet.
- Task each group to discuss the activities/ events on the task sheet and calculate the time it takes to complete the activities. **Collaborative Learning**.
- Call groups to tell the class what they agreed on.

Review

Differentiated lesson
Low ability learners
Learners tell the estimated time it takes to complete given activities.

High ability learners
Learners tell the estimated time it takes to complete given activities.

Assessment for Learning
Refer learners to page 288 of the Learner's Book for exercise

Suggested homework
Write four activities and use the criteria in the table to find out how long it takes to complete the activities

Activity	Start	finish	How long?

For additional exercises on this module, refer to pages 211 - 213 of the Workbook

Module 9: Reading the calendar

Content Standard:
B3.3.3.3: Demonstrate an understanding of time taken by events in days, weeks and months

Indicator:
B3.3.3.3.2: Read dates on the calendar, order dates of events and count days, weeks, months and years taken by given events.

Learning Expectation:
Learners can:
Read dates and events on the calendar

Essential for Learning:
Learners need to: be able to talk about the time it takes to complete simple events.

New Words:
calendar, dates, events, days, weeks, months, years

Resources:
Calendar

Number of Lessons 2

Starter:
Play: "Race to 0"

Have pupils put 99 on their place value mat, using bundle of 10s and 1s.
Call out a number between 1 and 10, for example 6. Pupils must remove that number of straws in their place value mat
Call out another number between 1 and 10. Pupils must again remove that number of straws or sticks from the straws on their place value mat. If they do not have enough ones in the ones' places to subtract, they must trade a bundle of 10 for 10 ones, place them in the one's column and then subtract.
Continue calling out numbers or pupils to subtract until they end up with 0 on their mat.

Find Out:
Direct learners to "Find Out" on page 268 of the Learner's Book.
Say: Look at the calendar. **Ask**: Have you read one before? What did you use it for? Explain that the calendar shows all the days in March 2019. How many days are there in March?

Lesson 1: (January, FebruaryMarch, April, May, June)

Let us Learn:
- Direct learners to Let us Learn on page 268 Explain that calendars help us to plan our time and remember special occasions, like birthdays. We find time intervals by counting on weeks and days.
- Go over the names of the first six months with class.
- Put learners into groups and present each group with a calendar.
- Give groups a piece of paper with a date written on it.
- Task learners to read the date from the calendar by circling the day in the right month.

Review

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 269 of the Learner's Book for exercise

Lesson 2: (July, August, September, October, November, December)

Let us Learn:

- Direct learners to Let us Learn on page 268 of the Learner's Book.
- Go over the names of the last six months with class.
- Put learners into groups and present each group with a calendar.
- Task learners to read the date from the calendar by circling the day in the right month.
- Lead class to identify the dates for some of the yearly occasions like Christmas, Easter, Ramadan, etc.

Review

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 270 of the Learner's Book for exercise

Suggested home works

1. Write the number of days in each of the month.
2. Write the date of your mother and father's/ guardian's birthday.
3. Write the names of the months of the year.

For additional exercises on this module, refer to pages 214 - 217 of the Workbook

Module 10: Solving problems with time

Content Standard
B3.3.3.3: Demonstrate an understanding of time taken by events in days, weeks and months

Indicator
B3.3.3.3.3: Relate the number of seconds to a minute, minutes to an hour and days to a month in a problem-solving context.

Learning Expectation:
Learners can:
Solve problems with time

Essential for Learning
Learners need to:
be able to talk about the time it takes to complete simple events

New Words
seconds, minutes, hours, day, weeks, months, years

Resources:
Calendar

Number of Lessons 3

Starter
Play: "Race to 0"

Have pupils put 99 on their place value mat, using bundles of 10s and 1s.

Call out a number between 1 and 10, for example, 6. Learners must remove that number of straws in their place value mat.

Call out another number between 1 and 10. Learner's must again remove that number of straws or sticks from the straws on their place value mat. If they do not have enough ones in the ones' places to subtract, they must trade a bundle of 10 for 10 ones, place them in the one's column and then subtract.

Continue calling out numbers or learners to subtract until they end up with 0 on their mat.

Find Out
Direct learners to "Find Out" on page 272 of the Learner's Book.
Say: Look at the picture. It takes Kweku 90minutes to jog from his house to the beach every Saturday morning. Can we say the 90 minutes in hours? How many hours can we find in 90 minutes?

Lesson 1: (Minutes and seconds)

Let us Learn:
- Direct learners to Let us Learn on page 272
- Explain that we can use analogue or digital clocks and watches to tell the time. Go over the names of the first six months with class. Time starts with seconds. As the seconds move, we get minutes, then hours, then days, and so on. There are 60 seconds in a minute.

60 seconds one minute;
60 minutes one hour;
24 hours one day;
7 days one week
52 weeks one year;
12 months one year

- Put learners into groups and present each group with a task sheet.
- Task them to complete the tasks. E.g.
  4 minutes = ……..seconds
  1munite = ……..seconds
  ……..minutes = 360seconds
- Allow learners time to make presentation to class.

Review

Differentiated lesson
Low ability learners
- Learners convert seconds into minutes and vice versa.

High ability learners

1. Learners convert seconds into minutes and vice versa.

Assessment for Learning

Refer learners to page 273 of the Learner's Book for exercise

Lesson 2: (Minutes and hours)

Let us Learn:

- Direct learners to Let's Learn in page…..
  60 minutes are equivalent to 1hour and 24 hours are equivalent to 1 day.
  We can work out other equivalences using mental calculation strategies. For example:

60 seconds one minute;
60 minutes one hour;
24 hours one day;
7 days one week
52 weeks one year;
12 months one year

- Put learners into groups and present each group with a task sheet.
- Task them to complete the tasks. E.g.
  120 minutes = ……..hours
  240munites = ……..hours
  .....….minutes = 3hours
- Allow learners time to make presentation to class.

Review

Differentiated lesson
Low ability learners

- Learners convert hours into minutes and vice versa

High ability learners

- Learners convert hours into minutes and vice versa

Assessment for Learning

Refer learners to page 274 of the Learner's Book for exercise

Lesson 3: (Hours and days ,weeks, months and year)

Let us Learn:

- Direct learners to Let's Learn in page…..
  24 hours are equivalent to 1 day. 7 days make 1 week etc.

60 seconds one minute;
60 minutes one hour;
24 hours one day;
7 days one week
52 weeks one year;
12 months one year

- Put learners into groups and present each group with a task sheet.
- Task them to complete the tasks.
- Allow learners time to make presentation to class.

Review

Differentiated lesson
Low ability learners

- Learners convert hours into days; days into weeks, etc. and vice versa

High ability learners

- Learners convert hours into days; days into weeks, etc. and vice versa. **Assessment:** Refer learners to page …. of their learners' book for exercise

Suggested homework

Complete the tables

a)

seconds	minutes
360	…...
120	…..
……	10

b)

hours	minutes
2	……
…….	120
…..	480

c)

hours	days
24	.....
….....	2
…….	4

For additional exercises on this module, refer to pages 218 - 219 of the Workbook

Encourage learners to do the reflection exercises on page 296 after this sub-strand.

Learners complete the self-assessment table on page 297. This will help you know each learner's strength and weaknesses.

Strand: 4

Data

Module 1: Gathering and organizing data

Content Standard
B3.4.1.1: Collect first –hand data and organize it using talks, checkmarks etc.

Indicator:
Gather and record Data

Learning Expectation:
Learners will be able to: Gather and record data to answer questions

Essentials for Learning:
Learners can group objects and count to find how many.

New words:
tally, labels, data, information, chart, record.

Resources:
different mineral bottle caps, pictures of fruits, pebbles (stones)

Number of Lessons 2

Lesson 1: Collecting and organizing data (1)

Starter
How many make 10?. Show a number of fingers and learners call out a number which when added to the number of fingers show make to.

Find out
Refer learners to page 200 of the Learner's Book, learners identify and count the number of vegetables and record it.

Garden eggs	__	15
Tomatoes	__	18
Onions	__	9

Let Us Learn 1

- Have learners pick different types of items outside classroom. Group them according to the items picked. Learners count and record the number of items picked. leaves, stones, flowers
- Have learners tally the number of items collected

Item	Tally	Number
leaves		23
stones		15
flowers		27

(critical thinking, collaborative learning)

- Display objects (bottle caps) on a table. Have learner in their groups sort and record their finding in a tally chart. Learners go round and compare their findings. Learners select a leader to record their findings on the board.

Drinks	Tally	Number
Fanta		29
coke		16
sprite		22

(critical thinking, collaboration learning, leardership attention)

- Refer learners to page 300 of their book. Go through the exercises with them.
- Learners use the data for find out to draw a Tally chart.

Review
Count and draw a tally table for the following items;
(coloured bottle caps)
(8 blue, 10 red, and 5 white)

Assessment for learning
Refer learners to exercises 1 on page 302 of the Learner's Book.

Suggested Home Work
Count and tally the number of spoons, cups and plates in your house.

Lesson 2: Collecting and organizing data (2)

Starter
Play multiple of numbers, if you say 1 you are out, if you say 2, you are in; so multiples of 2 are: 2, 4, 6, 8, 10, 12 ……

Let us Learn

- Call out learners to mention their favourite colours. Learners draw tally chart for the colours mentioned. Learners work in groups of five. Learners ask questions base on the tally chart.

Colours	Tally	Number
Green		20
white		15
yellow		24

1) How many learners mentioned Green?
2) How many more learners mentioned yellow than white?
3) Which colour is like most?

- Display tally chart, have learners ask questions base on the chart by themselves. Let learners answer the question among themselves.

Learners favourite food.

Food	Tally	Number
ampesie	𝍸 //	8
banku	𝍸 𝍸 ///	13
waakye	𝍸 𝍸 𝍸 //	32

1) What is the difference between learners who like waakye and banku?
2) How many learners like waakye?
3) How many did not like banku?
(critical thinking, collaborative learning, problem solving skill)

Refer learners to page 301 of the Learner's Book to answer the questions there

Review
Draw a tally table on the board. Learners work in pairs and answer questions based on the table.

Subject	Tally	Number
math		
English		
science		

1) How many like mathematics and science?
2) How many less learners like science than English?
3) Which of the subject is liked the most?

Assessment for learning
Refer learners to learners book page 303 for exercise

Suggested Home Work
Draw a tally chart for the favourite colour at your family members.

For additional exercises on this module, refer to pages 222 - 224 of the Workbook

Module 2: Drawing and interpreting graphs

Contend standard
B3.4.1.2: Construct and interpret concrete graphs and pictographs to solve problems

Indicator
B3.4.1.2.1: Draw and interpret Concrete graph and pictographs to solve problems

Learning Expectation
Learners need to be able: to draw and interpret graphs.

Essentials for Learning
Learners can organize and draw tally table for a given
data

New Words
interpret, concrete, graph, pictograph

Resources
bottle caps, pictures of fruit, animals, balls, sheets of paper, cut out shapes of animals, fruits

Number of Lessons 3

Starter
Play: Multiples of five; if you say any number which is not a multiple of 5 you are out so.
Multiple of 5: 5, 10, 15 …. in so 5, 10, 15 20_ _

Find out
Refer learners to page 304 of the Learner's Book.
Learners discuss the activities there and state the sports they like best.

Lesson 1: Drawing concrete graph and pictograph

Let us learn

- Give learners cut out shapes. Learners work in groups of five. Learners arrange the shapes in line (vertical/horizontal) forming concrete graph.
  Concrete graph
  Diagram
- Display fruit cut out cards on a table. Learners in their groups write the fruit they like best on a sheet of paper. Learners pick the fruit and paste it against the one they like best.

Fruit	Number of fruit
pear	
mango	
Alasa	

- Refer learners to page 304 of the Learner's Book. Go through the Let us Learn 1 with them. Learmers identify the number of mangoes picked for the 3 days.

Review

Low Ability Learners

- Give different bottle caps to learners. Let learners arrange it in line both vertical and horizontal.

fanta → 8, coke → 5, sprite – 11

High Ability learners

- In groups of five, learners mention the fruits they like best. Use cut-out shapes of fruits to form a picture graph.

Assessment for learning
Refer learners to page 309 of the Learner's Book for exercises

Suggested Home Work
1 Draw a concrete graph for the table below.

onions	12
pepper	15
tomato	8

2 In your house, count the number of bowls, cups and spoons and draw a picture graph for it.

Lesson 2: Drawing bar graphs

Starter
Learners sing a song "I'm counting one"

Let us Learn
- Displace a chart with different kinds of animals on the board
- Have learners count each type of animal and record it.
- Use the records above to draw a bar graph in their groups.

cat	3
sheep	6
goat	8

- Learner draw a bar graph to show the number of animals selected
- Draw a table showing learners favourite drinks. Have learners in group of five represent their favourite drinks with in a bar graph. Learners compare their graphs with other group members.

Drinks	
fanta	10
sprite	8
coke	5

Refer learners to page 306 of the Learner's Book and go through the activities with them.

Review
Draw a bar graph for the table below.
Favourite Food of Primary 3 learners.

food	Number
rice	7
fufu	5
Gari and beans	3

Assessment for Learning
Refer learners to exercise 2 page 309 of the Learner's Book for exercises.

Suggested Home Work
Draw a bar graph this for my favorite pet

Pet	No of Learners
cat	4
dog	5
sheep	6

Lesson 3: Interpretation of graphs

Starter
Play counting by 4s up to 40.
If you say 3 you are out, if you say 4 you are in so 4, 8, 12, 16 __ __ __

Let us Learn
- Put learners in groups of five. Learners mention their favourite numbers and one records on a sheet of paper. Learners ask questions among themselves.

Favourite numbers

Number	Number of learners
Two	18
five	15
ten	28

1) How many learners like five?
2) How many more learners like Ten than Two?
3) Which number is liked the most?

Display a chart showing a bar graph to learners in their groups. Have learners ask questions based on the graph. Let learners answer the questions among themselves. Refer learners to page 307 of the Learner's Book. Go through the activities at Let us Learn 3 with them.

Review
Learners work in pairs. Learners answer these questions.
1) How many learners come to school by foot?
2) How many more learners come to school by foot than by bicycle?
3) How many learners come to school by cars?
4) Which one is the most popular means of transport?

Assessment for Learning
Refer learners to page 310 of the Learner's Book for exercises

Suggested Home work
1) How many more plates than spoons do you have in your house?
2) How many less girls than boys in your family?

For additional exercises on this module, refer to pages 225 - 227 of the Workbook

Encourage learners to do the reflection exercises on pages 311 after this sub-strand.

Learners complete the self-assessment table on page 312. This will help you know each learner's strength and weaknesses.

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

Module 1: Number names

Exercise 1 Page 9
1 b 2 a 3 c 4 b 5 a

Exercise 2 Page 10
1 → d 2 → e 3 → a 4 → b 5 → c

Module 2: Counting Sequence (1)
Exercise 1 Page 14
1 36, 38, 39 and 41
2 98, 97, 95 and 93
3 88, 91, 92 and 94
4 46, 49, 50 and 53
5 102, 101, 98 and 96

Exercise 2 Page 15
1 235, 255, 265 and 285
2 733, 713, 703 and 683
3 556, 526, 496 and 486
4 989, 979, 959 and 949
5 750

Exercise 3 Page 16
1 856, 806, 706 and 656
2 351, 401, 551 and 601
3 354 and 555
4 8 numbers
5 968, 918, 868, 818, 768 and 718

Module 3: Counting Sequences (2)
Exercise 1 Page 19
1 850
2 745
3 462, 562, 662, 762, 862, 962
4 3324, 3224, 3124, 3024, 2924, 2824
5 7845, 7945, 8045

Exercise 2 Page 20
1 475, 975, 1475, 1975, 2475, 2975
2 1313, 2813, 3313, 4313
3 8639, 8139, 6639, 5639
4 623, 1623, 2623, 3123,
5 7942, 7442, 6442
6 9000, 8500, 8000

Exercise 3 Page 21
1 1129, 2129, 3129, 4129, 5129, 6129
2 712, 1712, 2712, 3712, 4712, 5712, 6712
3 456, 1456, 2456, 3456, 4456, 5456, 6456
4 3140, 4140, 5140, 6140, 7140, 8140, 9140
5 200, 1200, 2200, 3200, 4200, 5200, 6200

Module 4: Estimation quantities
Exercise 1 Page 23
1 Estimate – Learner's answer Actual count – 38
2 Estimate – Learner's answer Actual count – 99
3 Estimate – Learner's answer Actual count – 54
4 Estimate – Learner's answer Actual count – 44
5 Estimate – Learner's answer Actual count – 64
6 Estimate – Learner's answer Actual count – 48

Module 5: Representing numbers or quantities with numerals
Exercise 1 Page 24
1 683
2 852
3 455
4 974
5 1000

Exercise 2 Page 28
1 623
2 841
3 362
4 903
5 1000

Module 6: Writing number names
Exercise 1 Page 33
Coloured numbers: 30, 40, 50, 70
30 – Thirty; 40 – Forty; 50 – Fifty;
70 – Seventy

Exercise 2 Page 34
1 → b 2 → d 3 → f 4 → a 5 → g
6 → e 7 → c

Module 7: Describing the position of numbers
Exercise 1 Page 37
1 check on learners answers.
2 3,812, 9185, 1613
3 2,547, 671
4 8,428
5 990

ANSWERS

Module 8: Relationship between Numbers

Exercise 1 Page 42

1 2,412 and 2,402 Not the same. Reason – learners reason
2 4,314 and 3,424 not the same Reason – learners reason
3 2,410 and 2,310 Not the same – learners reason

Exercise 2 Page 44

1 431 Diagram
2 2421 Diagram
3 2545 Diagram
4 3101 Diagram
5 6214 Diagram

Module 9: Describing the relationship between numbers up to 10,000

Exercise 1 48

1 → C 2 → e 3 → a 4 → b 5 → d

Exercise 2 Page 49

1 5,332
2 6,306
3 8,103
4 9,210
5 10,000

Module 10: Relationship between numbers

Exercise 1 Page 53

1 764
2 Any one of these: 174,176,471,476,671,674.
3 146
4 Any one of these: 614,617,641,647,671,674.
5 Any one of these: 164,174,614,674,714,764.
6

Exercise 2 Page 54

Question 1 to 4 check on Learner's answers.
Question 5 to 7: Any three of these numbers.
368: Three hundred and sixty eight
386: Three hundred and eighty six
638: Six hundred and thirty eight
683: Six hundred and eighty three
836: Eight hundred and thirty six
863: Eight hundred and sixty three

Module 11: Decomposing numbers

Exercise 1 Page 56

1 625 - 600 - 20 - 5
2 804 - 800 - 60 - 4
3 2,458 - 2,000 - 400 - 50 - 8
4 4,507 - 4,000 - 500 - 0 - 7
5 5,000 - 5,000 - 0 - 0 - 0

Exercise 2 Page 57

1 5,455 - 5,000 - 400 - 50 - 5
2 8,070 - 8,000 - 0 - 70 - 0
3 7,264 - 7,000 - 200 - 60 - 4
4 9,663 - 9,000 - 600 - 60 - 3
5 6,307 - 6,000 - 300 - 0 - 7

Module 12: Comparing and ordering while numbers

Exercise 1 Page 60

1 120 is a little smaller than 128
128 is a litter larger than 120
2 932 is a lot larger than 549
549 is a lot smaller than 932
3 10,000 is a lot larger than 4351
4351 is a lot smaller than 10,000
4 258 is a lot smaller than 8258
8258 is a lot larger than 258
5 672 is a little smaller than 675
675 is a little larger than 672
6 720 is a lot smaller than 800
800 is a lot larger than 720

Exercise 2 Page 61

1 > 2 < 3 = 4 < 5 >

Module 13: Comparing and ordering whole numbers (2)

Exercise 1 Page 66

1 145, 240, 296, 363, 581
2 898, 995, 3571, 4305, 5002
3 597, 672, 795, 823, 832
4 984, 948, 894, 849, 498
5 632, 623, 362, 326, 236

Exercise 2 Page 67

1 167, 173, 177, 183, 185, 187
2 465, 475, 485, 490, 510, 520
3 983, 953, 933, 923, 893, 883
4 4845, 5045, 5245, 5345, 5645, 5845
5 10000, 9950, 9800, 9750, 9650, 9550

Exercise 3 Page 68

1 795, 764, 753, 746, 735
2 586, 580, 568, 558, 508
3 9170, 9107, 7910, 1970, 1709
4 375, 537, 573, 735, 753
5 689, 999, 1502, 2154, 5210

Module 14: Comparing and ordering whole numbers (3)

Exercise 1 Page 71

1 2590, 2740, 2840, 2990, 3040
2 6900, 7200, 7600, 7700, 8000
3 8851, 8901, 9101, 9251, 9301
4 9000, 9300, 9600, 9800, 10000
5 100, 300, 500, 600, 700, 900
6

Exercise 2 Page 72

1 102, 103, 104, 105, 106, 107, 108, 109
2 360, 370, 380, 390, 400, 410, 420, 430
3 517, 519, 523, 525, 527, 529, 531
4 813, 818, 823, 828, 833, 838, 843
5 147, 157, 167, 177, 187, 197, 207, 227,

Exercise 3 Page 72

1

	38	
47	48	49
	58	

2

	249	
258	259	260
	269	

3

	577	
586	587	588
	597	

4

	4513	
4522	4523	4524
	4533	

5

	989	
989	999	1000
	1009	

Module 15: Comparing and ordering whole numbers (4)

Exercise 1 Page 74

1 Fatima sold 110 loaves more than Araba or Araba sold 110 loaves less than Fatima.
2 Maame Mansah has 425 less than Papa Dela or Papa Dela has 425 cartons more cartons than maame Mansah.
3 Mr. Kotey has GH¢550 more than Madam Korkor or Madam Korkor has Gh¢550 less than Mr. Kotey.
4 Mr Allotey has 300 seedlings more than Mr. Boadi or Mr. Boadi has 300 seedlings less than Mr. Allotey.

Module 16: Positive and negative number representation

Exercise 1 Page 77

1 Negative
2 Positive
3 Positive
4 Positive
5 negative

Module 17: Describing situations using positive and negative values

Exercise 1 Page 80

1 -5 -4 -2 0 3 4 6
2 -9 -8 0 3 5 8
3 -7 -5 -4 0 4 5 7
4 -8 -5 -3 0 3 6
5 -6 -4 -2 0 4 9

Module 18: Counting forwards and backwards

Exercise 1 Page 83

1 4 2 2 3 1 4 5 5 -2

Exercise 2 Page 84

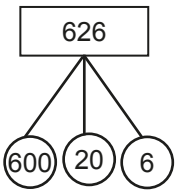
1 24°c 2 -8°c 3 -10°c
4 -2 5 -5 6 -6

Reflection Exercise 1 Page 85

1 a 5,015 b 9,807
2 a Three thousand and seventy five.
b Eight thousand and seventy five.
3 a 454; 504; 554.
b 5,150; 4,850; 4,750.
c 4,506, 5006, 6006.
4 2,220

Reflection Exercise 2 Page 86

1 a



b 2,345 = 2,000+300+40+5

2 Check on learners answers- Any 3 dugut numbers.
3 a > b > c = d <
4 137, 319, 379, 739, 897.
5 8,900; 9,200; 9,500; 9,900

6 a Gh¢4.00 b Gh¢1.00

Strand 1: Number
Sub-Strand 2: Number Operations (Addition, Subtraction, Multiplication and Division

Module 1: Addition and subtraction facts (fluency1)

Exercise 1 Page 91
1 122 2 74 3 359
4 84 5 223

Exercise 2
1 48 2 52 3 66
4 234 5 386

Module 2: Addition And Subtraction facts (2)
Exercise 1 Page 95
1 82 2 96 3 64
4 941 5 981

Exercise 2
1 43 2 41 3 683
4 777 5 503

Module 3: Addition and subtraction
Exercise 1 Page100
1 ≠ 2 = 3 ≠ 4 ≠

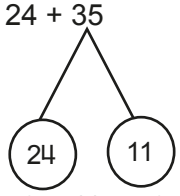
Exercise 2 Page 101
1 a = b, = c, ≠ d = e =
2 a 106 b < 79 or > 79
c < 221 or > 221 d 776

Module 4: Relationship between addition and subtraction
Exercise 1 Page 105
1 156 / 243 2 538 / 538
3 212 / 212 4 725 / 206
5 295 / 295

Exercise 2
1 32 2 48 3 29
4 84

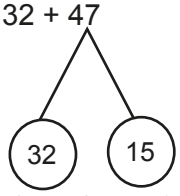
Module 5: Addition strategies (1)
Exercise 1 Page107
1 a 13 b 13 c 10 d 3
2 a 6 b 7+6=13 c 6 d **13 -7=**6
3 a 8 b 9 c 17 - 9 d 8
4 a 5 b 5+8=13 c 13-8=5 d 13-5=8
5 a 9 b 9+6=15 c 15 - 9 = 6 d 15 - 6 = 9

Module 6: Addition strategies (2)
Exercise 1 Page 110
1 24 + 35



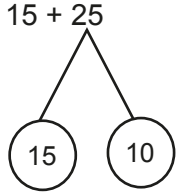
48 + 11 = 59

2 32 + 47



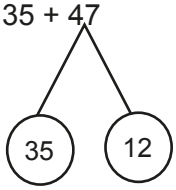
64 + 15 = 79

3 15 + 25



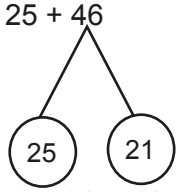
30 + 10 = 40

4 35 + 47



70 + 12 = 82

5 25 + 46



50 + 21 = 71

Exercise 2 Page 110
1 43 2 91 3 38
4 53 5 92

Module 7: Addition strategies (3)
Exercise 1 Page 113
1 87 2 74 3 64
4 72 5 100

Exercise 2 Page 114
1 90 2 83 3 95
4 100

Exercise 3
1 82 2 91 3 85
4 87

Module 8: Subtraction strategies (1)

Exercise 1 Page 117

1 11 2 22 3 25
4 44 5 28

Exercise 2

1 13 2 31 3 32
4 23 5 15
6 46

Exercise 3 Page118

1 21 2 26 3 34
4 36 5 40 6 47

Module 9: Subtraction strategies (2)

Exercise 1 Page 123

1 34 2 27 3 14
4 27 5 26

Exercise 2

1 21 2 29 3 37
4 33 5 38

Module 10: Addition of 2 and 3 digit numbers

Exercise 1 Page127

1 35 + 23 = 58 2 56 + 23 = 79
3 54 + 23 = 77 4 425 + 66 = 491

Exercise 2 Page 128

1 125 + 143 = 268 2 425 + 306 = 731
3 416 + 105 = 521 4 376 + 447 = 823
5 346 + 253 = 599

Module 11: Subtraction of 2-and 3-digit numbers

Exercise 1 Page 134

1 21 2 34 3 34
4 319 5 367

Exercise 2

1 274 2 126 3 166
4 319 5 267

Module 12: Addition of whole numbers (1)

Exercise 1 Page 138

1 377 2 667 3 479
4 615 5 799

Exercise 2 Page 139

1 628 2 767 3 604
4 919 5 790 6 300

Exercise 3

1 399 2 513 3 881
4 629 5 530

Module 13: Addition of whole numbers (2)

Exercise 1 Page 142

1 674 2 850 3 694
4 820 5 954

Exercise 2 Page 143

1 784 2 879 3 448
4 906 5 866

Module 14: Subtraction of whole numbers (1)

Exercise 1 Page 147

1 164 2 252 3 411
4 322 5 328 6 390

Exercise 2 Page 148

check learners answers.

Module 15: Subtraction of whole numbers (2)

Exercise 1 Page152

1 264 – 38 = 264 – 40 + 2 = 226
2 443 – 27 = 443 – 30 + 3 = 416
3 562 – 149 = 562 – 150 + 1 = 413
4 856 – 328 = 856 – 330 + 2 = 528
5 373 – 55 = 373 – 60 + 5 = 318

Exercise Page 153

Example 110 1 327 2 216
3 418 4 362 5 523

Module 16: Word problems addition and subtraction

Exercise 1 Page 160

1 452 → 500 2 252 → 300
+ 324 → 300 + 368 → 400
800 700

3 363 → 400 4 598 → 600
+ 429 → 400 + 176 → 200
800 800

5 463 → 500 6 846 → 800
+ 99 → 100 + 136 → 100
600 900

ANSWERS

Exercise 2 Page 161

1

572	–	235	=	?
600	–	200	=	400

2

682	–	457	=	?
700	–	500	=	200

3

672	–	252	=	?
700	–	300	=	400

Module 17: Commutative property of addition

Exercise 1 Page 164

1 a 45 + 32 = 77
b 32 + 45 = 77 a = b

2 a 82 + 14 = 96
b 14 + 82 = 96 a = b

3 a 347 + 421 = 768
b 421 + 347 = 768 a = b

4 a 652 + 143 = 795
b 143 + 652 = 795

5 a 523 + 406 = 929
b 406 + 523 = 929

6 a 372 + 616 = 988
b 616 + 372 = 988 a = b

Module 18: Multiplication (1)

Exercise 1 Page 167

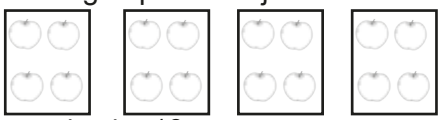
1 3 groups of 6 = 3 x 6 = 18 in all
2 2 groups of 3 = 2 x 3 = 6 in all
3 3 groups of 4 = 3 x 4 = 12 in all
4 4 groups of 5= 4 x 5 = 20 in all
5 5 groups of 2 = 10 in all

Execise 2 Page 169

1 2 groups of 6 objects

2 x 6 = 12

2 4 groups of 4 objects



4 x 4 = 16

3 3 groups of 7 objects

3 x 7 = 21

Module 19: Multiplcation (2)

Exercise 1 Page 173

1 4 × 6 = 24
2 3 × 7 = 21
3 5 × 5 = 25
4 3 × 9 = 27

Exercise 2 Page 174

1 5 × 5 = 25
2 4 × 6 = 24
3 7 × 4 = 28
4 2 × 9 = 18
5 5 × 8 = 40
6 3 × 5 = 15

Module 20: Multiplcation (3)

Exercise 1 Page178

1a 7 × 2 = 14 1b 4 × 4 = 16 1c 3 × 5 = 15

2a 7 × 2 = 14 2b 9 × 3 = 27

Exercise 2 Page 179

0	5	10	15	20	25	30	35	40	45

1 0 5 10 15 20 25 30 35 40 45
2 a 4 × 5 = 20
b 5 × 2 = 10
c 8 × 5 = 40
d 5 × 3 = 15
e 9 × 5 = 45
f 5 × 1 = 5
g 0 × 5 = 0
h 5 × 7 = 35
i 6 × 5 = 30

Module 21: Multiplication

Exercise 1 Page 183

1 12 2 30 3 20 4 21

Module 22: Division (1)
Exercise 1 Page 186

1 15 ÷ 5 = 3
5 groups of 3

2 20 ÷ 5 = 4
5 groups of 4

3 18 ÷ 3 = 6
3 groups of 6

4 8 ÷ 2 = 4
2 groups of 8

Exercise 2 Page 188

Example: 30 ÷ **5 = 6**

1 21 ÷ 3 = 7

2 12 ÷ 4 = 3

3 20 ÷ 4 = 5

4 21 ÷ 3 = 7

5 14 ÷ 7 = 2

Module 23: Division (2)
Exercise 1 Page 193

1 4 2 7 3 9
4 6 5 7

Exercise 2 Page 194

1 5 2 2 3 4
4 4 5 6 6 9

Module 24: Division (3)
Exercise 1 Page 197

1 6 2 4 3 3
4 4 5 9 6 9

Exercise 2 Page 198

1 5 2 8 3 9
4 7 5 5 6 5

Reflection Exercise 3 Page 199

1 a 73 b 51 2 56 3 a 93 b 738
4 25

Reflection Exercise 4 Page 199

1 a 32 b 543 2 a 77;80 b 377;377

H	T	O
-	7 4	5 3
	3	2

	H	T	O
-	6	2 8	7 4
		4	3

3 1→b 2→d 3→e 4→a 5→c

4a 8 b 7 c 9

Strand 1: Number
Sub-Strand 3: Fractions
Module 1: Unit fractions
Exercise 1 Page 203

1 $\frac{1}{3}$ 2 $\frac{1}{5}$ 3 $\frac{1}{8}$
4 $\frac{1}{6}$ 5 $\frac{1}{4}$ 6 $\frac{1}{2}$

Exercise 2 Page 204
To be done by learners in different ways.

Module 2: Multiples of unit fractions
Exercise 1 Page 207

1	1/8	2/8	3/8	4/8	5/8	6/8	7/8	8/8
2	2/10	2/10	3/10	4/10	5/10	6/10	7/10	8/10
3	1/6	2/6	3/6	4/6	5/6	6/6	7/6	8/6
4	1/5	2/5	3/5	4/5	5/5	6/5	7/5	8/5

Exercise 2 Page 208

1 $\frac{1}{6}$ 2 $\frac{4}{9}$ 3 $\frac{5}{8}$
4 $\frac{3}{9}$ 5 $\frac{4}{6}$ 6 $\frac{4}{10}$

Module 3: Fraction of a group
Exercise 1 Page 210

1 $\frac{6}{12}$ or $\frac{1}{2}$ 2 $\frac{2}{8}$ or $\frac{1}{4}$
3 $\frac{3}{12}$ or $\frac{1}{4}$ 4 $\frac{5}{14}$

Exercise 2
To be done by learners. Page 211

ANSWERS

Module 4: Comparing and ordering unit fractions
Exercise 1 Page 213

1 $\frac{1}{6}$ $\frac{2}{6}$ $\frac{3}{6}$ $\frac{4}{6}$ $\frac{5}{6}$
2 $\frac{1}{8}$ $\frac{2}{8}$ $\frac{3}{8}$ $\frac{4}{8}$ $\frac{5}{8}$ $\frac{7}{8}$
3 $\frac{1}{5}$ $\frac{2}{5}$ $\frac{3}{5}$ $\frac{4}{5}$ $\frac{5}{5}$
4 $\frac{1}{3}$ $\frac{2}{3}$ $\frac{3}{3}$ $\frac{4}{3}$ $\frac{5}{3}$ $\frac{6}{3}$ $\frac{7}{3}$

Exercise 2 Page 214
1) 4/7 is bigger than 3/8
2) 5/8 is bigger than 1/8
3) 3/4 is bigger than 2/3
4) 2/8 is bigger than 1/6

Reflection Exercise 5 Page 215
1 $\frac{1}{6}$ 2 $\frac{1}{2}$ 3 $\frac{1}{4}$ 4 $\frac{1}{3}$

Question 5 to 7 check or learners answer

8 $\frac{3}{6}$ 9 $\frac{4}{5}$

10 check learners answers

Strand 1: Number
Sub-Strand 4: Money
Module 1: Paying the exact amount
Exercise 1 Page 218 and 219
1 - 3 To be done by learners.
4 GH¢18.20P b GH¢26.00P
5 GH¢7.80P

Exercise 2 Page 220 and 221
1 GH¢16
2 GH¢5.50 or GH¢5 50p
3 GH¢19.70 or GH¢ 19 70p

Module 2: Taking change
Exercise 1 Page 224
1 GH¢2.00 or GH¢ 2
2 GH¢4.50 or GH¢4 50p
3 GH¢11.80 or GH¢11 80p
4 GH¢17.00 or GH¢17
5 GH¢18.50 or GH¢18 50p

Exercise 2 Page 225
1 GH¢ 0.50 or 50p 2 GH¢ 2.50 or GH¢ 2 50 p
3 GH¢ 15.00 or GH¢ 15
4 GH¢ 38.40 or GH¢ 38 40p
5 GH¢ 14.20 or GH¢ 14 20p

Reflection Exercise 6 Page 226
Question 1, 2 and 3 check learners answers
4 Gh¢2.00 5 False

Strand 2: Algebra
Sub-Strand 1: Patterns and Relationship
Module 1: Increasing and decreasing patterns
Exercise 1 Page 230
1 21, 12, Rule: Subtract 9
2 71, 78 Rule: Add 7
3 87, 95 Rule: Add 8
4 27, 22 Rule: Subtract 5
5 65, 59 Rule: Subtract 6

Exercise 2 Page 231
1 66, 71, 76, 81, 86, 91
2 78, 73, 68, 63, 58, 53
3 27, 31, 35, 39, 43, 47
4 85, 82, 79, 76, 73, 70
5 94, 84, 74, 64, 54, 44

Module 2: Errors in patterns
Exercise 1 Page 233
1 Error 32 correct number 30
2 Error 116 correct number 115
3 Error 82 correct number 83
4 Error 40 correct number 43
5 Error 101 correct number 102

Exercise 2
1 72, 87 and 117
2 28, 73 and 88
3 60, 120 and 480
4 4 and 25
5 67, 57 and 47

Reflection Exercise 7 Page 240
1 Rule 1: Add 7

2 85, 90, 95.

3a 57, 49, 41, 33, 25, 17

b 38, 45, 52, 59, 66, 73

4 Error 81; Correct number 79

Strand 3: Geometry and measurement
Sub-Strand 1: 2D shapes and 3D objects

Module 1: Describing solid shapes (1)
Exercise 1 Page 243
Check learners answers.

Exercise 2 Page 244

3-D objects	faces	edges	vertices
cube	6	12	8
sphere	1	0	0
cone	2	1	1
cylinder	3	2	0

Exercise 3 Page 245

3-D objects	faces	edges	vertices
pyramid	4	6	4
rectangular prism	6	12	8
cuboid	6	12	8
triangular prism	5	9	6

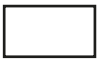
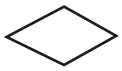
Module 2: Regular and irregular shapes
Exercise 1 Page 247

1 ✓ 2 × 3 ×

4 ✓ 5 × 6 ×

Exercise 2 Page 248
To be done by learners.
Regular shapes---- 2, 3, 6
Irregular shapes ---- 1, 4, 5, 7, 8.

Module 3: Angles
Exercise 1 Page 250

shape	number of angles	equal or unequal angles
	4	equal
	3	unequal
	4	equal
	6	equal
	4	unequal

Module 4: Angles that are right angles
Exercise 1 Page 253

1 ✓ 2 ✓ 3 ×

4 × 5 × 6 ×

Exercise 2 Page 254
check on Learners' answers.

Module 5: Quadrilaterals
Exercise 1
To be done by learners.

Exercise 2 Page 257
Quadrilaterals - (Blue) - 1, 2 and 5
Non-quadreilaterals (Red) - 3 and 4

Reflection Exercise 8 Page 258

1a Rectangle b pentagon

2a and b Check on learners' answers.

3

Name	Faces	Edges	Vertices
cube	6	12	8
cone	2	1	1
triangular pyramid	4	6	4

4a and b Check on learners' answers.

ANSWERS

Strand 3: Geometry and measurement
Sub-Strand 2: Position/Transformation

Module 1: Positioning
Exercise 1 Page 261
Check on learners' answers

Exercise 2 Page 262
1 A 4cm B 4 cm

2 C 2.5cm D 2.2cm

3 E 3.2cm F 3.2cm

Reflection Exercise 9 Page 263
Check on learners' answers

Strand 3: Geometry and meaurement
Sub-strand 3: Measurement -Length, Mass and Capacity
Module 1: Measurement of length
Exercise 1 Page 265

1	3cm	2	2cm	3	4cm
4	5cm	5	8cm		

Exercise 2 Page 266
Check on learners' answers

Module 2: Measurement of Length (relationship between cm and m)
Exercise 1 Page 268

1	1.5m	2	3.7m	3	2.5m
4	5m	5	4.5m	6	6m

Exercise 2 Page 268

1	400cm	2	350cm
3	500cm	4	300cm
5	700cm	6	280cm

Module 3: Measurement of length (relationship between cm and m)
Exercise 1 Page 270
Check on learners' answers

Module 4: Perimeter
Exercise 1 Page 272

1	20cm	2	15cm
3	24cm	4	24cm

Exercise 2 Page 273

1	20m	2	27cm	3	28cm
4	25m	5	19cm		

Module 5: Measurement Of Mass (relationship kilogram and gram; litres and millilitres)

Exercise 1 Page 276

1 3 kg 2 5 kg
3 7 kg 4 2 kg

Exercise 2 Page 277

Grams	Kilograms
1000	1
3000	3
2500	2.5
3500	3.5
1500	1.5

Exercise 3 Page 277

1 700ml 2 800ml
3 300ml 4 500ml

Exercise 4 Page 278

Litres	Millilitres
1	1000
4.5	4500
2	2000
3	3000
3.3	3300

Module 6 and 7:
Practical activities. Teachers/facilitators are to check on learners answers.

Module 8: Measurement Of Time 2

Exercise 1 Page 288

1 1 hour 45minutes
2 table tennis – 15 minutes
3 netball – 1 hour 45 minutes
4 basketball – 2 hours 50 minutes
5 football – 1 hour 25 minutes

Exercise 2 Page 288

1 7 hour 30 minutes
2 2 hour 15 minutes
3 50 minutes
4 1 hour 10 minutes
5 45 minutes

Module 9: Reading the calendar

Exercise 1 Page 290

Answers depend on learners calendar year

1 4th, 11th, 18th and 25th April, 2019
2 November 30
3 October 31
4 May 31
5 March 31
6 September 30
7 February 28
8 January 31
9 June 30
10 February
11 January, March, May, July, August, October and December

Exercise 2 Page 291

1a Tuesday 1b Wednesday
1c Wednesday 1d Saturday
2 June 3 18 days 4 14 days

Module 10: Solving problems with time

Exercise 1 Page 294

1 180 seconds
2 360 seconds
3 240 seconds
4 900 seconds
5 5 hours
6 3 hours
7 11 hours
8 4 hours
9 6 hours
10 7 hours

Exercise 2 Page 294

1 7 days 2 24 hours
3 60 minutes 4 600 seconds

Reflection Rxercise 10 Page 296

1a 200cm b 150cm
2a 23.5m b 4m
3 22cm
4a 5l b 4000ml
5 25 minutes
6 Check on learners' answers
7 180 seconds
8 January, March, May, July, August, October, December.

Strand 4: Data
Sub-Strand 1: Data Collection, Organisation, Presentation, Interpretation and Analysis
Module 1: Gathering and organizing data
Exercise 1 Page 302
a 25 **b** 13 **c** 7

Exercise 2 Page 303
1 84 learners
2 Pineapple
3 Orange
4 50 learners
5 12 pineapples

Module 2: Drawing and interpreting graphs
Exercise 1 Page 309
To be done by learners.

Exercise 2 Page 309
To be done by learners.

Exercise 3 Page 310
1 8 learners **2** 18 learners
3 4 learners
4 yellow 16 learners **5** 46 learners

Reflection Exercise 11 Page 311
1a

Shape	Tally	Number
△	𝍸 𝍸 𝍸 ||	
○	𝍸 𝍸 ||	
□	𝍸 ||||	

b 38
c 8
d 5
e 29

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

Trial 1 Page 2

1 1,000
2 1,200
3 4,540
4 2,806
5 3,115

Trial 2

1 One thousand four hundred and fifty six
2 Three thousand and seventy three
3 Two thousand five hundred and seven
4 Four thousand four hundred and forty four
5 Five thousand

Trial 3 Page 3

1 6,075
2 10,000
3 8,541
4 9,266

Trial 4

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

Module 2: Counting Sequence (1)

Trial 1 Page 5

1 17, 19, 22, 23
2 57, 58, 61, 62
3 97, 94, 93, 90
4 213, 212, 210, 209, 207
5 1,004, 1,006, 1,008, 1,009

Trial 2

1 330, 340, 370
2 948, 958, 988
3 87, 77, 27
4 572, 562, 532
5 2065, 2075, 2105

Trial 3 Page 6

1a 20
b 30, 40
c 50 and 60
d 70, 80
e 90, 100
f 110, 120
2 934, 944, 954, 964, 974, 984.

Trial 4 Page 7

1 66, 36, 26, 16
2 90, 80, 60, 30
3 610, 600, 580, 570
4 1522, 1502, 1482, 1462

Module 3: Counting Sequences (2)

Trial 1 Page 8

1 505, 705
2 1792, 2092
3 5737, 5537
4 679, 479
5 4615, 4815

Trial 2 Page 9

1 750, 1250, 1750, 2250, 2750, 3250, 3750.
2 623, 1123, 3123.
3 67
4 5050
5 8500, 8000, 7500, 7000, 6500, 6000, 5500

Trial 3 Page 10

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

Module 4: Estimation quantities

Trial 1 Page 11

1 Actual count 18
2 Actual count 16
3 Actual count 20

Trial 2 Page 12

To be done by learners
1 Actual count 29
2 Actual count 38
3 Actual count 36
4 Actual count 28
5 Actual count 15

Trial 3 Page 13
Estimation to be done by learners
1 Actual count 45
2 Actual count 28
3 Actual count 13
4 Actual count 30
5 Actual count 49

Module 5: Representing numbers or quantities with numerals
Trial 1 Page 15
1 5, 3, 6, 536, 536
2 3, 5, 1, 351, 351
3 8, 0, 0, 800, 800
4 2, 6, 9, 269, 269
5 9, 0, 0, 900, 900

Trial 2 Page 17
1 130 2 104
3 523 4 825
5 366

Trial 3 Page 18
1 Seven hundred and seventy seven 777
2 Four hundred and two 402
3 Three hundred and fifty 350
4 Five hundred and forty two 542

Module 6: Writing number names
Trial 1 Page 19
1 seventy
2 80
3 fifty
4 ninety
5 30

Trial 2
1 one hundred → d (100)
2 four hundred → a (400)
3 five hundred → e (500)
4 eight hundred → b (800)
5 one thousand → c (1000)

Trial 3 Page 19
Multiples of 100: 400, 700, 800, 1000.
four hundred
seven hundred
eight hundred
one thousand

Module 7: Describing the position of numbers
Trial 1 Page 21
1 To be done by learners
2 812; 185; 613
3 547; 671
4 428
5 990

Trial 2 Page 22
1 Two; 4962, 3430
2 10,000
3 3430
4 2405, 4832, 9939
5 To be done by learners

Module 8: Relationship between numbers
Trial 1 Page 23
1 492 2 341 3 88
4 222 5 111

Trial 2 Page 25
1 → e(404)
2 → b(162)
3 → d(339)
4 → a(86)

Trial 3 Page 26
1 862 2 625 3 561
4 309 5 2670

Trial 4 Page 27
1 423 2 671 3 505
4 246 5 2580

Module 9: Describing the relationship between numbers up to 10,000
Trial 1 Page 28
To be done by learners

Trial 2 Page 29
1 540
2 602
3 335
4 1000
5 3104

Trial 3 Page 31
To be done by learners

ANSWERS

Module 10: Relationship between numbers

Trial 1 Page 33

1 b 2 c 3 a
4 c 5 a

Trial 2 Page 33

1 fifty-four
2 Two hundred and thirty six
3 four hundred and eighty
4 Nine hundred and five
5 Eight hundred and seventy

Trial 3 Page 34

1 five hundred and eighty two
2 nine hundred and eight
3 one thousand
4 three hundred and seventy seven
5 eight hundred and eighty two

Module 11: Decomposing numbers

Trial 1 Page 35

1 700 + 80 + 5
2 900 + 20 + 8
3 1000 + 900 + 0 + 9
4 4000 + 800 + 60 + 2
5 3000 + 400 + 90 + 0

Trial 2 Page 36

1 752 → 700, 50, 2

2 1482 → 1000, 400, 80, 2

3 2048 → 2000, 0, 40, 8

4 4956 → 4000, 900, 50, 6

5 3218 → 3000, 200, 10, 8

Trial 3 Page 37

1 7000 + 500 + 30 + 1
2 6000 + 0 + 40 + 9
3 8000 + 500 + 20 + 8
4 9000 + 900 + 0 + 9
5 5000 + 100 + 50 + 0

Module 12: Comparing and ordering while numbers

Trial 1 Page 38

Learners can compare in other ways

1 238 is a little smaller than 239
2 8357 is a lot larger than 485
3 1272 is a lot smaller than 9272
4 4391 is a lot larger than 628
5 10,000 is a little larger than 9999

Trial 2 Page 38

1 < 2 >
3 < 4 <
5 >

Trial 3 Page 39

1 >
2 <
3 >
4 <
5 >

Module 13: Comparing and ordering whole numbers (2)

Trial 1 Page 40

1 598, 746, 807, 926, 1001
2 6076, 7183, 7742, 8318, 9605
3 751, 715, 571, 175, 157
4 963, 693, 639, 396, 369
5 876, 867, 786, 768, 687

Trial 2 Page 41

1 158, 249, 375, 467, 568, 689
2 1368, 3654, 3754, 4870, 6470, 8470
3 498, 586, 687, 748, 768, 954
4 10,000, 9182, 8234, 4983, 1982, 1928
5 7563, 6753, 6653, 5836, 5763, 3657

Trial 3 Page 42

1 6158, 6518, 6851, 8561, 8615
2 5994, 9095, 9549, 9945, 10000
3 4978, 4971, 4967, 4932, 4908, 4312
4 7986, 7865, 7806, 7771, 7282, 7069
5 9814, 9482, 8994, 8849, 4698, 4499

Module 14: Comparing and ordering whole numbers (3)

Trial 1 Page 43

1 160, 165, 180, 190, 195
2 776, 976, 1176, 1276, 1576
3 1059, 1109, 1209, 1309, 1359
4 386, 392, 394, 400, 408

5 633, 638, 658, 668, 683

Trial 2 Page 44

1

		113
121	122	
141	142	
151	152	
161	162	
	172	
	182	

2

	46	
	56	
66	67	

3

4537		4539
	4547	
	4557	

4

197		199
	207	
	217	

Trial 3 Page 45

	67	77	87	97	107	117	127	137	147
157		177	187	197		217	227	237	247
257	267	277	287	297	307		327	337	347
	367	377			407			437	447
			487	497	507	517	527	537	547
557	567	577	587		607	617		637	647
657	667	677	687	697	707	717		737	743
757	767	777	787	797		817	827		

Module 15: Comparing and ordering whole numbers (4)

Trial 1 Page 46

1 a Esi's friend Zinabu
a 940 – 359 = 581
2 a Antwi
b (834 – 298) = Gh¢536
3 a last year
b 654 – 287 = 367
4 a Mr. Mensah
b 768 – 500 = 268
5 a Kyei
b 576 – 399 = 177

Trial 2 Page 48

Can be expressed in another form by learner

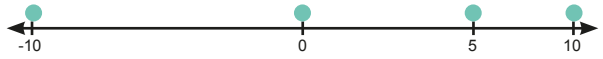
1 Doe has a lot larger number of eraser than Amina
2 Seidu
3 Mr Ampadu
4 Esinam has a lot larger number of mangoes than Konadu.
5 Efua saw a little more red cars than Dzifa.

Module 16: Positive and negative number representation

Trial 1 Page 49

1 – 3
2 + 1
3 – 5
4 + 4
5 – 6
6 + 7m

Trial 2 Page 50

1


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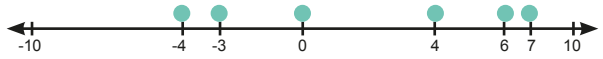

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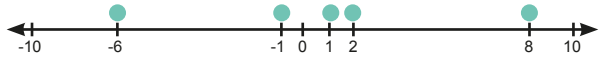

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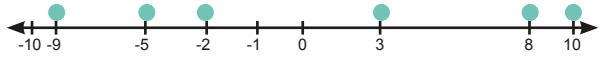
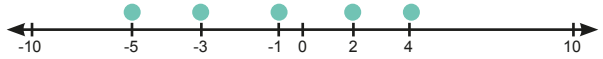
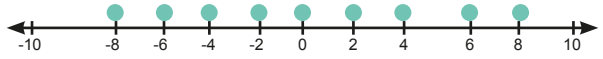


Trial 3 Page 51

1


2


3


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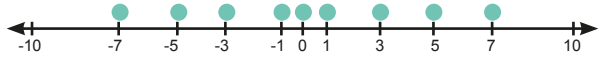

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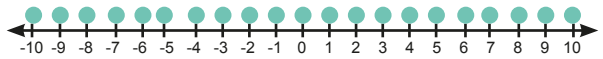


Module 17: Descibing situations using positive and negative values

Trial 1 Page 52

Learners to do these for discussion with facilitator

Trial 2 Page 53

Learners to do these for dicussion

ANSWERS

Module 18: Counting forwards and backwards

Trial 1 Page 54

1 12 °C 2 8 °C
3 4 °C 4 2 °C

Trial 2 Page 55

1 6 2 2 3 0
4 4 5 5

Trial 3 Page 56

1 –3 2 –3 3 –4
4 –5 5 –6

Trial 4 Page 57

1 –9 2 –5 3 –2
4 –3 5 –4

Strand 1: Number
Sub-Strand 2: Number Operation (Addition, Subtraction, Multiplication and Division
Module 1: Addition and subtraction facts (fluency 1).

Trial 1 Page 59

1 ? = 98 + 79 ? = 177
2 ? = 638 + 78 ? = 716
3 235 + ? = 624 624 – 235 = 389
4 232 + ? = 586 586 – 232 = 354
5 563 + ? = 874 874 – 563 = 311

Trial 2 Page 60

1 658 – ? = 320
658 – ? = 320
? = 338

2 493 – ? = 193
= 493 – 193
? = 300

3 935 – ? = 720
= 935 – 720
? = 215

4 98 – ? = 63
= 98 – 63
? = 35

Trial 3 Page 61

1 61 2 123
3 635 4 206
5 642

Module 2: Addition and subtraction facts (fluency 2)

Trial 1 Page 62

1 85
2 494
3 783
4 941
5 923

Trial 2 Page 63

1 213
2 440
3 537
4 461
5 280

Trial 3 Page 64 & 65

1 43
2 25
3 151
4 389
5 369

Module 3: Addition and subtraction

Trial 1 Page 66

Learners to do these for discussion

Trial 2 Page 68

1 ≠ 2 = 3 =
4 ≠ 5 =

Trial 3 Page 68

Learners to do these for discussion with facilitator

Module 4: Relationship between Addition and Subtraction

Trial 1 Page 69

1 84, 84 2 39 , 39
3 73, 73 4 58, 58
5 87, 87

Trial 2

1 293; 352 + 293 = 645
2 206; 276 + 206 = 482
3 635; 218 + 635 = 853
4 545; 438 + 545 = 983

Trial 3 Page 70

1 113; 35 + 113 = 148
2 268; 263 – 43 = 225
3 522; 326 + 522 = 848
4 498; 498 – 142 = 356
5 288; 438 + 288 = 726

Module 5: Addition strategies (1)

Trial 1 Page 71

1 → a
2 → f
3 → e
4 → b
5 → d

Trial 2 Page 72

1 9, 7, 4, 3 2 10, 9
3 7, 8 4 6, 8

In questions 2, 3, and 4, check on learners answers for the last two lines.

Trial 3 Page 73

Learners to do these for discussion

Module 6: Addition strategies (2)

Trial 1 Page 74

1 55; 25 + 25 + 5 = 55
2 64; 22 + 22 + 20 = 64
3 54; 16 + 16 + 22 = 54
4 89; 32 + 32 + 25 = 89

Trial 2 Page 75

1 63
2 97
3 81
4 100
5 94

Trial 3 Page 76

1 63
2 72
3 80
4 53
5 82

Module 7: Addition strategies (3)

Trial 1 Page 78

1 92 2 82 3 95
4 95

Trial 2 Page 79

1 283
2 417
3 527
4 313
5 720

Trial 3 Page 81

1 416 2 310 3 692
4 649 5 870

Module 8: Subtraction strategies (1)

Trial 1 Page 82

1 26 2 34 3 36
4 17

Trial 2 Page 83

1 33 2 32 3 25
4 40 5 51

Trial 3 Page 85

1 48 – 32 = 16
2 48 – 25 = 23
3 92 – 48 = 44
4 58 – 30 = 28
5 98 – 47 = 51

Module 9: Subtraction strategies (2)

Trial 1 Page 87

1 43 2 16 3 38
4 15 5 32

Trial 2 Page 88

1 29 2 37
3 33 4 38

Module 10: Addition of 2 and 3 digit numbers

Trial 1 Page 91

1 59 2 73 3 54
4 282 5 230

Trial 2 Page 93

1 83 2 94
3 286 4 94

Trial 3 Page 94

1 389 2 593 3 618
4 911 5 465

ANSWERS

Module 11: Subtraction of 2-and 3-digit numbers

Trial 1 Page 97

1 75 – 38 =37
2 85 – 58 = 27
3 358 – 58 = 300
4 262 – 47 = 215

Trial 2 Page 98

1 27 2 216
3 491 4 773

Trial 3 Page 100

1 179 2 341
3 240 4 363
5 170

Module 12: Addition of whole numbers (1)

Trial 1 Page 101

1 777
2 869
3 892

Trial 2 Page 102

1 97 2 71
3 92 4 137
5 110 6 119

Trial 3 Page 103

1 686
2 988
3 652 + 45 = 697
4 547 + 160 = 707

Module 13: Addition of whole numbers (2)

Trial 1 Page 104

1 965 2 921
3 764 4 1085

Trial 2 Page 105

1 295 2 421
3 541 4 744
5 602

Trial 3 Page 107

1 153 2 257
3 728 4 121
5 900

Module 14: Subtraction of whole numbers (1)

Trial 1 Page 109

1 231 2 318
3 217 4 388

Trial 2 Page 111

1 84 2 322
3 421 4 284
5 419

Trial 3 Page 112

1 110 2 595
3 295 4 362
5 676

Module 15: Subtraction of whole numbers (2)

Trial 1 Page 114

1 109 2 339
3 355 4 278
5 507

Trial 2 Page 115

1 Gh¢418.00 2 413 3 444

Trial 3 Page 116

1 232 2 392 3 275
4 388 5 343

Module 16: Word problems addition and subtraction

Trial 1 Page 117

Check on learners

Trial 2 Page 119

Estimate be done by learners before adding.

Trial 3 Page 121

Learners to do the estimation and work out

Module 17: Commutative property of addition

Trial 1 Page 123

Learners to do these

Trial 2 Page 125

Learners to do these for discussion with facilitator

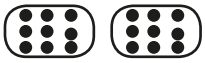
ANSWERS

Module 18: Multiplication (1)

Trial 1 Page 126

1 3 x 2 = 6 2 4 x 4 = 16
3 5 x 6 = 30 4 3 x 5 = 15
5 1 x 7 = 7

Trial 2 Page 128

1 4 x 3 = 12
2 2 x 5 =10
3 4 x 6 = 24 
4 2 x 9 = 18 
5 5 x 7 = 35 

Module 19: Multiplication (2)

Trial 1 Page 130

1 4 x 5 = 20 = 5 x 4
2 5 x 3 = 15 = 3 x 5
3 2 x 7 = 14 = 7 x 2
4 5 x 6 = 30 = 6 x 5
5 4 x 8 = 32 = 8 x 4
6 8 x 3 = 24 = 3 x 8

Trial 2 Page 131

1 4 x 7 = 28 2 3 x 8 = 24
3 3 x 6 = 18 4 6 x 11 = 66
5 6 x 8 = 48

Trial 3 Page 132

1 32 2 42
3 20 4 15
5 18

Module 20: Multiplication 3

Trial 1 Page 133

x	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9
2	2	4	6	8	10	12	14	16	18
3	3	6	9	12	15	18	21	24	27
4	4	8	12	16	20	24	28	32	36
5	5	10	15	20	25	30	35	40	45
6	6	12	18	24	30	36	42	48	54
7	7	14	21	28	35	42	49	56	63
8	8	16	24	32	40	48	56	64	72
9	9	18	27	36	45	54	63	72	81

Trial 2 Page 134

1 4, 8, 12, 16, 20, 24, 28, 32
2 a =12, b = 32, c = 4, d = 8, e = 36, f =20, g = 24, h = 28

Trial 3

1 30, 5, 48, 27, 6
2 28, 9, 4, 9, 9

Trial 4 Page 135

Learners to do these for discussion.

Module 21: Multiplication
Trial 1 Page 136
1 8 + 8 + 8 = 24
8 x 3 = 24
2 5 + 5 + 5 + 5 = 20
5 x 4 = 20
3 2 + 2 + 2 + 2 = 8
2 x 4 = 8
4 6 + 6 + 6 + 6 + 6 = 30
6 x 5 = 30

Trial 2 Page 138
1 → c 2 → b
3 → e 4 → a

Trial 3 Page 139
1 5 + 5 = 10
2 x 5 = 10
2 5 + 5 + 5 = 15
3 x 5 = 15
3 5 + 5 + 5 + 5 = 20
4 x 5 = 20
4 6 + 6 + 6 + 6 = 24
4 x 6 = 24

Module 22: Division (1)
Trial 1 Page 140
1 5
2 9
3 4
4 8

Trial 2 Page 143
1 8 ÷ 4 = 2 2 15 ÷ 3 = 5
3 35 ÷ 5 = 7 4 28 ÷ 7 = 4
5 15 ÷ 2 = 9 Drawing to be done by learners

Trial 3 Page 145
1 36 2 9
3 4 4 36 ÷ 4 = 9

Module 23: Division (2)
Trial 1 Page 147
1 16 ÷ 2 = 8 2 20 ÷ 4 = 5
3 24 ÷ 4 = 6 4 9 ÷ 3 = 3

Trial 2 Page 148
1 4 2 5 3 6 4 5

Module 24: Division (3)
Trial 1 Page 149
1 56, 8, 56 2 2, 6, 6
3 45, 9, 5 4 7, 49, 7
5 54, 6, 54

Trial 2
1 6 2 3
3 6 4 4
5 8 6 4

Strand 1: Number
Sub-strand 3: fractions
Module 1: Unit fractions
Trial 1 Page 151
1 $\frac{1}{4}$ 2 $\frac{1}{8}$ 3 $\frac{1}{6}$
4 $\frac{1}{5}$ 5 $\frac{1}{2}$

Trial 2 Page 152
1 $\frac{1}{4}$ 2 $\frac{1}{6}$ 3 $\frac{1}{8}$
4 $\frac{1}{7}$ 5 $\frac{1}{10}$ 6 $\frac{1}{6}$

Module 2: Multiples of unit fractions
Trial 1 Page 153
Learners to do colouring in different ways

Trial 2 Page 154
1 $\frac{3}{6}$ 2 $\frac{5}{20}$ 3 $\frac{8}{48}$
4 $\frac{5}{40}$ 5 $\frac{6}{18}$

Trial 3 Page 155
1

0	$\frac{1}{4}$	$\frac{2}{4}$	$\frac{3}{4}$	$\frac{4}{4}$	$\frac{5}{4}$	$\frac{6}{4}$	$\frac{7}{4}$	$\frac{8}{4}$	$\frac{9}{4}$

2

$\frac{5}{8}$	$\frac{6}{8}$	$\frac{7}{8}$	$\frac{8}{8}$	$\frac{9}{8}$	$\frac{10}{8}$	$\frac{11}{8}$	$\frac{12}{8}$	$\frac{13}{8}$	$\frac{14}{8}$

3

$\frac{1}{3}$	$\frac{2}{3}$	$\frac{3}{3}$	$\frac{4}{3}$	$\frac{5}{3}$	$\frac{6}{3}$	$\frac{7}{3}$	$\frac{8}{3}$	$\frac{9}{3}$	$\frac{10}{3}$

4 | $\frac{4}{7}$ | $\frac{5}{7}$ | $\frac{6}{7}$ | $\frac{7}{7}$ | $\frac{8}{7}$ | $\frac{9}{7}$ | $\frac{10}{7}$ | $\frac{11}{7}$ | $\frac{12}{7}$ | $\frac{13}{7}$ |

5 | $\frac{1}{10}$ | $\frac{2}{10}$ | $\frac{3}{10}$ | $\frac{4}{10}$ | $\frac{5}{10}$ | $\frac{6}{10}$ | $\frac{7}{10}$ | $\frac{8}{10}$ | $\frac{9}{10}$ | $\frac{10}{10}$ |

Trial 4 Page 156

1 | $\frac{1}{7}$ | $\frac{2}{7}$ | $\frac{3}{7}$ | $\frac{4}{7}$ | $\frac{5}{7}$ | $\frac{6}{7}$ | $\frac{7}{7}$ | $\frac{8}{7}$ |

2 | $\frac{1}{5}$ | $\frac{2}{5}$ | $\frac{3}{5}$ | $\frac{4}{5}$ | $\frac{5}{5}$ | $\frac{6}{5}$ | $\frac{7}{5}$ | $\frac{8}{5}$ |

3 | $\frac{1}{8}$ | $\frac{2}{8}$ | $\frac{3}{8}$ | $\frac{4}{8}$ | $\frac{5}{8}$ | $\frac{6}{8}$ | $\frac{7}{8}$ | $\frac{8}{8}$ |

4 | $\frac{1}{9}$ | $\frac{2}{9}$ | $\frac{3}{9}$ | $\frac{4}{9}$ | $\frac{5}{9}$ | $\frac{6}{9}$ | $\frac{7}{9}$ | $\frac{8}{9}$ | $\frac{9}{9}$ |

Module 3: Fractions of a group

Trial 1 Page 157

1 **b** $\frac{1}{3}$ 2 **c** $\frac{1}{2}$ 3 **a** $\frac{4}{6}$

Trial 2 Page 158

1 $\frac{5}{10}$ 2 $\frac{8}{12}$ 3 $\frac{7}{11}$

4 $\frac{4}{6}$ 5 $\frac{8}{9}$

Trial 3 Page 159

To be done by learners in different ways

Module 4: Comparing and ordering unit factions

Trial 1

1 $\frac{3}{4}$ 2 $\frac{2}{3}$

3 $\frac{5}{6}$ 4 $\frac{4}{5}$ is larger

5 $\frac{2}{3}$ is larger

Trial 2 Page 161

1 $\frac{2}{3}$ 2 $\frac{2}{5}$ 3 $\frac{3}{4}$

4 $\frac{4}{6}$ 5 $\frac{1}{2}$ 6 $\frac{4}{5}$

Trial 3 Page 163

1 $\frac{4}{8}$ $\frac{3}{5}$ and $\frac{2}{3}$

2 $\frac{8}{10}$ $\frac{7}{8}$ and $\frac{6}{6}$

3 $\frac{3}{10}$ $\frac{1}{2}$ and $\frac{3}{4}$

4 $\frac{2}{4}$ $\frac{2}{5}$ and $\frac{3}{8}$

5 $\frac{4}{5}$ $\frac{4}{6}$ and $\frac{4}{10}$

6 $\frac{2}{2}$ $\frac{1}{3}$ and $\frac{2}{8}$

Strand 1: Number

Sub-strand 4: Money

Module 1: Paying the exact amount

Trial 1 Page 164

To be done by learners in different ways

Trial 2 Page 166

1 one Gh¢20 + one Gh¢5 + one 50p

2 one Gh¢20 + one Gh¢10 + one Gh¢5 + one Gh¢2

3 oneGh¢50 + oneGh¢20 + oneGh¢5

4 twoGh¢20 + oneGh¢5 + oneGh¢2 + oneGh¢1 + 20p +10p

5 oneGh¢50 + oneGh¢20 + one10p + one5p

Trial 3 Page 168

To be done by learners in different ways

Trial 4 Page 169

Learners do these for discussion with facilitators

Module 2: Taking change
Trial 1 Page 170
1 Gh¢ 13.00 2 Gh¢ 14.20
3 Gh¢ 3.75 4 Gh¢ 34.25
5 Gh¢ 7.40

Trial 2 Page 171
1 Total: Gh¢25.85 Change: Gh¢4.15
2 Total: Gh¢9.20 Change: Gh¢0.80
3 Total: Gh¢78.00 Change: Gh¢22.00
4 Detergent: Gh¢17.20 Cash: Gh¢20.00
5 Drinks: Gh¢15.00 Cash: Gh¢50.00

Strand 2: Algebra
Sub-Strand 1: Patterns and Relationships
Module 1: Increasing and decreasing patterns
Trial 1 Page 174
1 20, 31 2 63, 55
3 86, 71 4 19, 46
5 52, 67

Trial 2 Page 175
1 73, 77, 81 2 55, 61, 67
3 44, 36, 28, 20 4 40, 31, 22
Rule: Subtract 9
5 67, 72, 77
Rule: Add 5

Trial 3 Page 173
1 42, 46, 50, 54, 58, 62
2 73, 69, 65, 61, 57, 53
3 91, 84, 77, 70, 63, 56
4 28, 36, 44, 52, 60, 68
5 2, 4, 8, 16, 32, 64

Module 2: Errors in a patterns
Trial 1 Page 177
1 50, 65, 75
2 80, 50, 40
3 47, 39, 23, 7
4 70, 82, 88
5 73, 81, 89
6 99, 91, 83, 71

Trial 2 Page 178
1 80 + 5 Error 84
2 63 – 10 Error 43
3 80 + 15 Error 85
4 25 – 8 Error 19

Module 3: Increasing and decreasing patterns (100 number chart)
Trial 1 Page 179
1 Multiple of 11: 11, 22, 33, 44, 55, 66, 77, 88, 99
2 99, 88, 77, 66, 55, 44, 33, 22, 11
3 Multiples of 5: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55,100
4 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100

Trial 2 Page 180
1 85, 90, 95
an increasing pattern
2 66, 58, 50
a decreasing pattern
3 43, 36, 29
a decreasing pattern
4 72, 81, 90
an increasing pattern
5 75, 86, 97
an increasing pattern

Strand 3: Geometry and meaurement
Sub-strand 1: 2D shapes and 3D objects
Module 1: Describing solid shapes (1)
Trial 1 Page 182
1 cube 2 pyramid
3 cuboid 4 cone
5 prism

Trial 2 Page 183
1 → sphere 2 → cuboid
3 → cylinder 4 → cube
5 → prism 6 → cone

Trial 3 Page 184
1 cone 2 cuboid
3 cylinder 4 cube
5 prism

Module 2: Regular and irregular shapes
Trial 1 Page 185
Learners to do this

Trial 2 Page 186
Learners can do these in many different ways

Trial 3 Page 187

1 Triangle 2 Regular hexagon
3 Regular pentagon
4 Rectangle 5 Irregular pentagon
6 Regular octagon
7 Irregular hexagon 8 semicircle

Module 3: Angles
Trial 1 Page 188
Right angles - 1, 6 and 8

Trial 2 Page 189
Learners to do this

Module 4: Angles that are right angles
Trial 1 Page 190
For discussion –learners and facilitators

Trial 2 Page 191
Learners do these for discussion with facilitators

Module 5: Quadrilaterals
Trial 1 Page 192
Quadrilaterals (✓) –1, 2, 4 and 6
Not Quadriterals (x) –3, 5, 7 and 8

Trial 2 Page 193
1 Parallelogram ⟶ d
2 Rectangle ⟶ c
3 Trapezium ⟶ b
4 Rhombus ⟶ e
5 Square ⟶ a

Trial 3 Page 194
1 Square
2 Rectangle
3 Kite
4 Rhombus
5 Trapezium
6 Parallelogram

Strand 3: Geometry and meaurement
Sub-strand 2: Position/Transformation
Module 1: Positioning
Trial 1 Page 195
3 and 5

Trial 2 Page 196
Check on learners' answers

Sub-Strand 3: Measurement –Length, Mass and Capacity
Module 1: Measurement of length
Trial 1 Page 197
1 Three 2 Eight
3 Four 4 Four
5 One

Trial 2 Page 198
1 BD = 7cm 2 AC = 5cm 3 DF = 5cm
4 CD = 4cm 5 AF = 14cm 6 CF = 9cm

Module 2: Measurement of length (relationship between cm and m)
Trial 1 Page 199
1 cm 2 m
3 m 4 cm
5 cm 6 cm
7 metres 8 centimetres
9 centimetres 10 metre

Trial 2 Page 200
Learners to do these
1 AB = 4cm 2 AD = 10cm 3 EG = 7cm
4 HK = 3cm 5 CD = 4cm 6 JK = 9cm

Module 3: Measurement of length (relationship between cm and m)
Trial 1 Page 201
Learners to do these

Module 4: Perimeter
Trial 1 Page 202
1 12cm 2 20cm
3 12cm 4 6cm

Trial 2 Page 203
Addition can be done in different ways
1 3 + 3 + 4 + 4 = 14 cm
2 8 + 4 + 4 + 4 = 20 cm
3 7 + 5 + 3 + 3 + 6 = 24 cm
4 5 + 5 + 5 = 15

Trial 3 Page 204

Shape	Estimate	Actual
Hexagon	Learners' answer	12cm
Square	Learners' answer	12cm
Rectangle	Learners' answer	12cm
Triangle	Learners' answer	12cm

Module 5: Measuring of Mass (relationship kilogram and gram; litres and milliliters)

Trial 1 Page 205

1 kg 2 g
3 kg 4 g
5 kg 6 kg
7 kg 8 g

Trial 2 Page 206

To be done by learners

Module 6: Estimate mass and volume

Trial 1 Page 207

1 mℓ 2 ℓ
3 mℓ 4 ℓ
5 ℓ 6 mℓ
7 ml 8 ℓ

Trial 2 Page 208

To be done by learners

Module 7: Measurement of time

Trial 1 Page 209

To be done learners

Trial 2 Page 210

1 20mins 2 35mins
3 40mins 4 45mins
5 80mins 6 45mins

Module 8: Measurement of time (2)

Trial 1 Page 211

1 1hr or 60mins
2 20mins
3 1hr 15mins or 75mins
4 1hr 30mins or 90mins
5 1hr 30mins or 90mins

Trial 2 Page 212

1a 2hrs 30mins or $2\frac{1}{2}$ hrs or 150mins

2hrs 15mins or $2\frac{1}{4}$ hrs or 135mins

1hr 50mins or 110mins

2hrs 45mins or $2\frac{3}{4}$ hrs or 165mins

2 a 4th bus
b 3rd bus
c 55mins
d 4:45pm
e 4: 25pm

Module 9: Reading the calendar

Trial 1 Page 214

1 Tuesday
2 Thursday
3 10
4 Friday
5 12
6 January and October 2019

Trial 2 Page 216

1 4th April
2 1st July
3 6th June
4 24th June
5 28th August
6 5th Otober

Trial 3 Page 217

1 February
2 July
3 June
4 November
5 Friday
6 April, June, September, November

Module 10: Solving problems with time

Trial 1 Page 218

1 minutes
2 days
3 second
4 hours
5 months
6 weeks

Trial 2 Page 219

1 a 120 seconds b 180 seconds
2 a 120 minutes b 300 minutes

3 a 72 hours b 120 hours
4 a 3 days
5 156 minutes

Strand 4: Data
Sub-Strand 1: Data Collection, Organization, Interpretation, Presentation and Analysis
Module 1: Gathering and organizing data
Trial 1 Page 222
1

Sports	Tally
Footbal	𝍸 𝍸 𝍸 𝍸
Volleyball	𝍸 𝍸
Tennis ball	𝍸 𝍸 𝍸 ||

2 20, 10, 17

Trial 2 Page 223
1 18 2 11
3 Ampe 4 139
5 Ludo

Trial 3 Page 224
1 81 2 19
3 44 4 8
5 English

Module 2: Drawing and interpreting graphs
Trial 1 Page 225
Learners to do this

Trial 2 Page 226
Learners can do this using different scales on the vertical axis and different width of bars on the horizontal axis

Trial 3 Page 226
1 14 2 week 3
3 16 4 8
5 38

ESSENTIAL Mathematics Primary 3

Teacher's Guide

ESSENTIAL Mathematics Primary Book 3 is written to meet the full requirements of the current New Standards-based curriculum by the National Council for Curriculum and Assessment **(NaCCA)** with a problem-solving and discovery approach to the learning of Mathematics.

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