

MATHEMATICS

PRIMARY 3

TEACHER'S GUIDE

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FOREWORD

Dear teacher,

Rwanda Basic Education Board is honored to present P3 Mathematics teacher's guide. This book serves as a guide to competence-based teaching and learning to ensure consistency and coherence in the learning of Mathematics content for primary three. The Rwandan educational philosophy is to ensure that learners achieve full potential at every level of education which will prepare them to be well integrated in society and exploit employment opportunities.

In line with efforts to improve the quality of education, the government of Rwanda emphasizes the importance of aligning teaching and learning materials with the syllabus to facilitate their learning process. Many factors influence what they learn, how well they learn and the competences they acquire. Those factors include the relevance of the specific content, the quality of teachers' pedagogical approaches, the assessment strategies and the instructional materials available.

The special attention was paid to the activities that facilitate the learning process in which learners can develop ideas and make new discoveries during concrete activities carried out individually or with peers. With the help of the teachers, learners will gain appropriate skills and be able to apply what they have learnt in real life situations. Hence, they will be able to develop certain values and attitudes allowing them to make a difference not only to their own life but also to the nation.

This is in contrast to traditional learning theories which view learning mainly as a process of acquiring knowledge from the more knowledgeable who is mostly the teacher. In the regard of competence-based curriculum, learning is considered as a process of active building and developing of knowledge and skills by the learner where concepts are mainly introduced by an activity, situation or scenario that helps the learner to construct knowledge develop skills and acquire positive attitudes and values.

The book provides active teaching and learning techniques that engage pupils to develop competences. In view of this, your role is to:

- Plan your lessons and prepare appropriate teaching materials.
- Organize group discussions for pupils considering the importance of social constructivism suggesting that learning occurs more effectively when pupils works collaboratively with more knowledgeable and experienced people.
- Engage pupils through active learning methods such as inquiry methods, group discussions, research, investigative activities and group and individual work activities.

- Provide supervised opportunities for pupils to develop different competences by giving tasks which enhance critical thinking, problem solving, research, creativity and innovation, communication and cooperation.
- Support and facilitate the learning process by valuing pupils' contributions in the class activities.
- Guide pupils towards the harmonization of their findings.
- Encourage individual, peer and group evaluation of the work done in the classroom and use appropriate competence-based assessment approaches and methods.

To facilitate you in your teaching activities, the content of this book is self explanatory so that you can easily use it. It is divided in 3 parts:

The part I explain the structure of this book and give you the methodological guidance;

The part II gives a sample lesson plan;

The part III details the teaching guidance for each concept given in the pupil's book.

Even though this teacher's guide contains the guidance on solutions for some activities given in the student-teacher's book, you are requested to work through each question before judging pupils' findings.

I wish to sincerely extend my appreciation to the people who contributed towards the development and the translation of this book, particularly REB staff who organized the process from its inception. Special appreciation goes also to teachers who supported the exercise throughout.

Any comment or contribution would be welcome to the improvement of this textbook for the next versions.

Dr. MBARUSHIMANA Nelson

Director General of REB



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TABLE OF CONTENTS

FOREWORD	iii
ACKNOWLEDGEMENT	v
PART I: GENERAL INTRODUCTION	1
1.1. The structure of the teacher’s guide	1
1.2 Methodological guidance	4
PART II: SAMPLE LESSON	21
PART III: UNIT DEVELOPMENT	25
UNIT 1: NUMBERS UP TO 2000	25
1.1 Key unit competence	25
1.2 Prerequisite	25
1.3 Cross-cutting issues to be addressed	25
1.4. Sub-headings /list of lessons	25
1.5 Guidance on different lessons	28
1.6 Summary of the unit	61
1.7 Additional information for the teacher	61
1.8 Answers for the end unit assessment	61
1.9 Additional activities	62
UNIT 2: NUMBERS UP TO 5000	65
2.1 Key unit competence:	65
2.2 Prerequisite	65
2.3 Cross-cutting issues to be addressed	65
2.4 Sub-headings /List of lesson	65
2.5 Guidance on different lessons	68
2.6 Summary of the unit	86
2.7 Additional information for the teacher	86

2.8 Answers for the end unit assessment 2	87
2.9 Additional activities	87
UNIT 3: NUMBERS UP TO 10 000	91
3.1 Key unit competence.....	91
3.2 Prerequisite	91
3.3 Cross-cutting issues to be addressed	91
3.4 Sub-headings/ List of lessons	91
3.5 Guidance on different lessons for unit 3	94
3.6 Summary of the unit	117
3.7 Additional information for the teacher	117
3.8 Answers for the end unit assessment 3	117
UNIT 4: FRACTIONS HAVING A DENOMINATOR NOT GREATER THAN 10.....	119
4.1. Key unit competence.....	119
4.2. Prerequisite	119
4.3. Cross-cutting issues to be addressed	119
4.4. Sub-headings /List of lessons	120
4.5 Teaching and learning activities	121
4.8. Answers for the end unit assessment 4	143
UNIT 5: LENGTH MEASUREMENTS	146
5.1. Key unit competence.....	146
5.2. Prerequisite	146
5.3. Cross-cutting issues to be addressed	146
5.5 Guidance on different lessons of unit 5	147
5.6. Ending points of the unit.....	160
UNIT 6: MASS MEASUREMENTS FROM KILOGRAM TO GRAM	163
6.1. Key unit competence.....	163
6.2. Prerequisite	163

6.3. Cross-cutting issues to be addressed	163
6.4. Sub-headings/List of lessons	164
6.5. Teaching and learning activities	165
6.6. Ending points of the unit.....	177
UNIT 7: CAPACITY MEASUREMENT FROM LITRE (l)TO MILLILITRE (ml).....	179
7.1. Key unit competence.....	179
7.2. Prerequisite	179
7.3. Cross-cutting issues to be addressed	179
7.4. Sub-headings /list of lessons.....	180
7.5. Teaching and learning activities	181
7.6. Ending points of the unit.....	193
UNIT 8: RWANDAN CURRENCY FROM 1 Frw UP TO 5000 Frw	196
8.1. Key unit competence.....	196
8.2. Prerequisite	196
8.3. Cross-cutting issues to be addressed	196
8.4. Sub-headings / List of lesson.....	196
8.5. Guidance on different lessons for unit 8	198
UNIT 9: TIME MEASUREMENTS	209
9.1. Key unit competence:.....	209
9.2. Prerequisite	209
9.3. Cross-cutting issues to be addressed	209
9.4. Sub-headings /list of lessons.....	209
9.5. Guidance on different lessons for unit 9	211
9.6. Ending points of the unit.....	219
UNIT 10: TYPES OF LINES AND ANGLES	222
10.1. Key unit competence.....	222
10.2. Prerequisite	222

10.3. Crosscutting issues to be addressed in the lessons	222
10.4. Sub-headings / List of lessons nit	
10.5. Guidance on different lessons	223
10.6. Ending points of the unit 10	232
UNIT 11: SQUARE, RECTANGLE, TRIANGLE AND CIRCLE	234
11.1. key unit competence	234
11.2. Prerequisites	234
11.3. Cross cutting issues to be addressed.....	234
11.4. List of subtopics/ lessons.....	234
11.5. Guidance on different lessons	235
11.6. Ending points of the Unit	245
UNIT 12: GRIDS	247
12.1. Key unit competence	247
12.2. Prerequisite	247
12.3. Cross cutting issues to be addressed	247
12.4. List of sub-topics/lessons	247
12.5. Guidance on different lessons	248
12.6. Ending points of the unit 12	253
UNIT 13: MISSING NUMBER IN ADDITION, SUBTRACTION, MULTIPLICATION AND DIVISION	254
13.1. Key unit competence	254
13.2. Prerequisites	254
13.3. Cross cutting issues to be addressed	254
13.4. List of sub-topics/ lessons	254
13.5. Guidance on different lessons.....	255
UNIT 14: PICTOGRAPHS	272
14.1. Key unit competence	272
14.2. Prerequisites	272

14.3. Cross cutting issues to be addressed	272
14.4. List of sub-topics/lessons of this unit	272
14.5. Guidance on the teaching of different lessons for unit 14	273
14.6. Ending points of unit 14	276
END OF YEAR ASSESSMENT	278
ANSWERS FOR THE END YEAR ASSESSMENT	284
GLOSSARY	289
REFERENCES	294

PART I: GENERAL INTRODUCTION

Mathematics is a very important subject as it provides concepts that help learners to be equipped with skills, attitudes and values applicable when solving real life problems.

Mathematics helps learners to think critically. It guides them to have the culture of saving, economic development, and it provides values that allow people to promote social cohesion.

On a basic level, Mathematics helps people to be able to *count, add, subtract, multiply, and divide*.

At the psychological level, exposure to mathematics helps people in developing an *analytic mind* and assists them in *better organization of ideas and accurate expression of thoughts*.

At a more general level, far away from dealing with the higher mathematical concepts, the importance of mathematics for a common man is related to its *application in science and technology* and in the day-to-day activities of life.

1.1. The structure of the teacher's guide

This book is a teacher's guide for P3 Mathematics. It is designed to accompany P3 Mathematics Pupil's book and intends to help teachers to plan quality mathematics lessons during the implementation of competence-based curriculum.

As the name says, it is a guide that teachers can refer to when preparing their lessons. Teachers may prefer to adopt the guidance provided but they are also expected to be more creative and consider their specific classes' contexts and prepare accordingly.

In this regard, learning is considered as a process of active building and developing of knowledge and skills by the learner where concepts are mainly introduced by an activity, situation or scenario that helps the learner to construct knowledge develop skills and acquire positive attitudes and values.

The book provides active teaching and learning techniques that engage pupils to develop competences and achieve the expected objectives.

In addition, this book provides more guidance on the content, teaching resources, techniques and methods of teaching, learning activities and application activities.

This section presents the overall structure, the unit and sub-heading structure of Mathematics content. It will help teachers to understand the different sections of this guide and what they will find in each section.

Overall structure of this book:

This teacher's guide of P3 Mathematics is composed of three parts:

The Part I concerns general introduction that discusses methodological guidance on how best to teach and learn Mathematics developing competences in teaching and learning, address cross-cutting issues when teaching and learning and it provides a guidance on assessment.

Part II presents a sample lesson plan. This lesson plan serves to guide the teacher while planning his/her lessons depending on the nature of the topic to be taught, school environment, teaching aids and level of pupils.

The Part III is about **the structure of a unit** and **the structure of a lesson**. This includes information related to the different components of the unit and these components are the same for all units.

Structure of a unit

Each unit is made of the following sections:

- **Unit title:** from the syllabus
- **Key unit competence:** it highlights what the learner will be able to do at the end of the unit.
- **Prerequisites:** This section indicates knowledge, skills and attitudes learnt in previous levels that are required for the success of the unit. The competence-based approach calls for connections between units/ topics within a subject and interconnections between different subjects. The teacher will find an indication of those prerequisites and guidance on how to establish connections.
- **Cross-cutting issues to be addressed:** This section suggests cross cutting issues that can be integrated depending on the unit content. It provides guidance on how to come up with the integration of the issue. Note that the issue indicated is a suggestion; teachers are free to take another cross-cutting issue taking into consideration the learning environment.
- **New vocabulary:** This indicates the names of new concepts to be developed in the unit.
- **Guidance on the introductory activity:** Each unit starts with an introductory activity in the learner's book. This section of the teacher's guide provides guidance on how to conduct this activity and related answers. Note that learners may not be able to find the right solution, but they are invited to predict possible solutions or answers. Solutions are provided by learners gradually through discovery activities organized at the beginning of lessons or during the lesson.

– **Guidance on how to help learners with special educational needs in the classroom**

Even though this guidance is given in general introduction, where necessary, this book has provided in each unit the guidance on how the teacher can help learners with special education needs in classroom.

– **List of lessons/sub-headings in each unit**

Each unit has a table showing a suggestion on the list of lessons, lesson objectives copied or adapted from the syllabus and duration for each lesson. Each lesson / subheading is then developed.

– **Teaching techniques for every lesson**

This section shows the lesson objectives, Prerequisites/Revision/Introduction, Teaching resources, Learning activities and suggestion on answers for activities and application activities provided in the learner’s book.

– **End of each unit:**

At the end of each unit the teacher’s guide provides the following sections:

The summary of the unit which provides the key points of content developed in the student’s book,;

Additional information which provides additional content compared to the pupil’s book for the teacher to have a deeper understanding of the topic;

End unit assessment which provides the answers to questions of end unit assessment in the textbook;

Additional activities which provide more opportunities to learners with different levels (slow, average and gifted) to deepen the key unit competence.

Such activities are divided into remedial, consolidation and extended activities.

Structure of each lesson or sub heading

Each lesson/sub-heading is made of the following sections:

– **Lesson /Sub heading title**

- **Prerequisites/Revision/Introduction:** This section gives a clear instruction to teacher on the required skills to effectively learn the lesson. It can also how the teacher how to start the lesson.

– **Teaching and learning resources:** This section suggests the teaching aids or other resources needed in line with the activities to achieve the learning objectives. Teachers are encouraged to replace the suggested teaching aids by the available

ones in their respective schools and based on learning environment.

- Learning activities: This section provides a short description of the methodology and any important aspect to consider. It provides also answers to learning activities with cross reference to text book.
- Exercises/application activities: This provides questions and answers for exercises/application activities.

In a word, this part provides information and guidelines on how to facilitate pupils while working on activities. More other, it provides answers for some application activities given in the pupil's book.

1.2 Methodological guidance

1.2.1 Developing competences

Since the year 2015 Rwanda shifted from a knowledge based to a competency-based curriculum for pre-primary, primary and general secondary education. This called for changing the way of learning by shifting from teacher centered to a learner centered approach.

Teachers are not only responsible for knowledge transfer but also for fostering children's learning achievement and creating safe and supportive learning environment. It implies also that a learner has to demonstrate what he/she is able to do using the knowledge, skills, values and attitude acquired in a new or different or given situation.

The competence-based curriculum employs an approach of teaching and learning based on discrete skills rather than dwelling on only knowledge or the cognitive domain of learning. It focuses on what learner can do rather than what learners know.

Learners develop basic competences through specific subject unit competences with specific learning objectives broken down into knowledge, skills and attitudes. These competences are developed through learning activities disseminated in learner-centered rather than the traditional didactic approach. The student is evaluated against set standards to achieve before moving on.

In addition to specific subject competences, learners also develop generic competences which are transferable throughout a range of learning areas and situations in life. Below are examples of how generic competences can be developed in Mathematics.

Generic competences	Ways of developing generic competences
Critical thinking	All activities that require pupils to calculate, convert, interpret, analyse, compare and contrast, etc have a common factor of developing critical thinking into pupils.
Creativity and innovation	All activities that require pupils to apply skills in solving real life problems or to plot a pictograph of a given algebraic data have a common character of developing creativity into student-teachers.
Research and problem solving	All activities that require pupils to make a simple research in the library or on internet to find answers for given problems have a character of developing research and problem solving into pupils.
Communication	During Mathematics class, all activities that require pupils to discuss either in groups or in the class, present findings, debate etc, have a common character of developing communication skills.
Co-operation, interpersonal relations and life skills	All activities that require pupils to work in pairs or in groups have a character of developing cooperation and life skills among pupils.
Lifelong learning	All activities that instil in the learner the need for more learning have a common character of developing into learners a curiosity of applying the knowledge learnt in a range of situations. The purpose of such kind of activities is for life-long learning enabling pupils to be able to adapt to the fast-changing world and the uncertain future by taking initiative to update knowledge and skills with minimum external support.

The generic competences help pupils deepen their understanding of Mathematics and apply their knowledge in solving problems met in a range of situations.

1.2.2 Addressing cross cutting issues

Among the changes brought by the competence-based curriculum is the integration of cross cutting issues as an integral part of the teaching and learning process as they relate to and must be considered within all subjects to be appropriately addressed. The eight cross cutting issues identified in the national curriculum framework are: *Comprehensive Sexuality Education, Environment and Sustainability, Financial Education, Genocide studies, Gender, Inclusive Education, Peace and Values Education, and Standardization Culture.*

Some cross-cutting issues may seem specific to particular learning areas/subjects but the teacher needs to address all of them whenever an opportunity arises. In addition, pupils should always be given an opportunity during the learning process to address these cross-cutting issues both within and out of the classroom.

Below are examples of how crosscutting issues can be addressed:

Cross-Cutting Issue	Ways of addressing cross-cutting issues
<p>Environment and Sustainability: Integration of Environment, Climate Change and Sustainability in the curriculum focuses on and advocates for the need to balance economic growth, society well-being and ecological systems. Student-teachers need basic knowledge from the natural sciences, social sciences, and humanities to understand to interpret principles of sustainability.</p>	<p>Using word problems from real life experience, Mathematics teacher should lead learners to illustrate the situation of “population growth” and discuss its effects on the environment and sustainability.</p>
<p>Financial Education: The integration of Financial Education into the curriculum is aimed at a comprehensive Financial Education program as a precondition for achieving financial inclusion targets and improving the financial capability of Rwandans so that they can make appropriate financial decisions that best fit the circumstances of one’s life.</p>	<p>Through different examples and calculations on word problems from real life experience of pupils, Mathematics teacher can lead pupils to discuss how to make appropriate financial decisions.</p>
<p>Gender: At school, gender will be understood as family complementarities, gender roles and responsibilities, the need for gender equality and equity, gender stereotypes, gender sensitivity, etc.</p>	<p>Mathematics teacher should address gender as cross-cutting issue through assigning leading roles in the management of groups to both girls and boys and providing equal opportunity in the lesson participation and avoid any gender stereotype in the teaching and learning process.</p>

<p>Inclusive Education: Inclusion is based on the right of all learners to a quality and equitable education that meets their basic learning needs and understands the diversity of backgrounds and abilities as a learning opportunity.</p>	<p>Firstly, Mathematics teacher needs to identify/recognize pupils with special needs. Then by using adapted teaching and learning resources while conducting a lesson and setting appropriate tasks to the level of pupils, they can cater for pupils with special education needs.</p>
<p>Peace and Values Education: Peace and Values Education (PVE) is defined as education that promotes social cohesion, positive values, including pluralism and personal responsibility, empathy, critical thinking and action in order to build a more peaceful society.</p>	<p>Through a given lesson, a teacher should:</p> <ul style="list-style-type: none"> • Set a learning objective which is addressing positive attitudes and values, • Encourage pupils to develop the culture of tolerance during discussion and to be able to instil it in colleagues and cohabitants; • Encourage pupils to respect ideas for others.
<p>Standardization Culture: Standardization Culture in Rwanda will be promoted through formal education and plays a vital role in terms of health improvement, economic growth, industrialization, trade and general welfare of the people through the effective implementation of Standardization, Quality Assurance, Metrology and Testing.</p>	<p>With different word problems or charts related to the effective implementation of Standardization, Quality Assurance, Metrology and Testing, pupils can be motivated to be aware of health improvement, economic growth, industrialization, trade and general welfare of the people.</p>

1.2.3 Guidance on how to help learners with special education needs in classroom

In the classroom, pupils learn in different ways depending to their learning pace, needs or any other special problem they might have. However, the teacher has the responsibility to know how to adopt his/her methodologies and approaches in order to meet the learning needs of each pupil in the classroom. Also teachers need to understand that pupils with special needs have to be taught differently or need some accommodations to enhance the learning environment. This will be done depending on the subject and the nature of the lesson.

In order to create a well-rounded learning atmosphere, teachers need to:

- Remember that pupils learn in different ways, so they need a variety of activities (e.g. role-play, music and singing, word games and quizzes, and outdoor activities);
- Maintain an organized classroom and limit the distraction. This will help pupils with special needs to stay on track during lesson and follow instruction easily;
- Vary the pace of teaching to meet the needs of each child because some pupils process information and learn more slowly than others;
- Break down instructions into smaller, manageable tasks. Pupils with special needs often have difficulty in understanding long-winded or several instructions at once. It is better to use simple, concrete sentences in order to facilitate them understanding what you are asking.
- Use clear and consistent language to explain the meaning (and demonstrate or show pictures) if you introduce new words or concepts;
- Make full use of facial expressions, gestures and body language;
- Pair a pupil who has a disability with a friend. Let them do things together and learn from each other. Make sure the friend is not over-protective and does not do everything for the one with disability. Both pupils will benefit from this strategy;
- Use multi-sensory strategies. As all pupils learn in different ways, it is important to make every lesson as multi-sensory as possible. Pupils with learning disabilities might have difficulty in one area, while they might excel in another. For example, use both visual and auditory cues.

Below are general strategies related to each main category of disabilities and how to deal with every situation that may arise in the classroom. However, the list is not exhaustive because each child is unique with different needs and that should be handled differently.

Strategy to help pupils with intellectual impairment:

- Use simple words and sentences when giving instructions;
- Use real objects that pupils can feel and handle. Rather than just working abstractly with pen and paper;
- Break a task down into small steps or learning objectives. The pupil should start with an activity that she/he can do already before moving on to something that is more difficult;
- Gradually give the pupil less help;
- Let the pupil with disability work in the same group with those without disability.

Strategy to help pupils with visual impairment:

- Help pupils to use other senses (hearing, touch, smell and taste) and carry out activities that will promote their learning and development;
- Use simple, clear and consistent language;
- Use tactile objects to help explain a concept;
- If the pupil has some sight, ask him/her what he/she can see;
- Make sure the pupil has a group of friends who are helpful and who allow him/her to be as independent as possible;
- Plan activities so that pupils work in pairs or groups whenever possible.

Strategy to help pupils with hearing disabilities or communication difficulties

- Always get the pupils 'attention before you begin to speak;
- Encourage the pupil to look at your face;
- Use gestures, body language and facial expressions;
- Use pictures and objects as much as possible.
- Keep background noise to a minimum.

Strategies to help pupils with physical disabilities or mobility difficulties:

- Adapt activities so that pupils, who use wheelchairs or other mobility aids, can participate.
- Ask parents/caregivers to assist with adapting furniture e.g. the height of a table may need to be changed to make it easier for a pupil to reach it or fit their legs or wheelchair under;
- Encourage peer support when needed;
- Get advice from parents or a health professional about assistive devices if the pupil has one.

Adaptation of assessment strategies:

At the end of each unit, the teacher is advised to provide additional activities to help pupils achieve the key unit competence. These assessment activities are for remedial, consolidation and extension designed to cater for the needs of all categories of students; slow, average and gifted pupils respectively. Therefore, the teacher is expected to do assessment that fits individual pupil.

Remedial activities	After evaluation, slow pupils are provided with lower order thinking activities related to the concepts learnt to guide them in their learning. These activities can also be given to assist deepening knowledge acquired through the learning activities for slow pupils.
Consolidation activities	After introduction of any concept, a range number of activities can be provided to all pupils to enhance/reinforce learning.
Extended activities	After evaluation, gifted and talented pupils can be provided with high order thinking activities related to the concepts learnt to make them think deeply and critically. These activities can be assigned to gifted and talented pupils to keep them working while other pupils are getting up to required level of knowledge through the learning activity.

1.2.4. Guidance on assessment

Assessment is an integral part of teaching and learning process. The main purpose of assessment is for improvement of learning outcomes. Assessment for learning/Continuous/ formative assessment intends to improve pupils' learning and teacher's teaching whereas assessment of learning/summative assessment intends to improve the entire school's performance and education system in general.

Continuous/ formative assessment

It is an on-going process that arises during the teaching and learning process. It includes lesson evaluation and end of sub unit assessment. This formative assessment should play a big role in teaching and learning process. The teacher should encourage individual, peer and group evaluation of the work done in the classroom and uses appropriate competence-based assessment approaches and methods.

Formative assessment is used to:

- Determine the extent to which learning objectives are being achieved and competences are being acquired and to identify which pupils need remedial interventions, reinforcement as well as extended activities. The application activities are done in the pupil book and they are designed to be given as remedial, reinforcement, end lesson assessment, homework or assignment.
- Motivate pupils to learn and succeed by encouraging them to read, or learn more, revise, etc.

- Check effectiveness of teaching methods in terms of variety, appropriateness, relevance, or need for new approaches and strategies. Mathematics teachers need to consider various aspects of the instructional process including appropriate language levels, meaningful examples, suitable methods and teaching aids/ materials, etc.
- Help pupils to take control of their own learning.

In teaching Mathematics, formative or continuous assessment should compare performance against instructional objectives. Formative assessment should measure the s pupil’s ability with respect to a criterion or standard. For this reason, it is used to determine what pupils can do, rather than how much they know.

Summative assessment

The assessment can serve as summative and informative depending to its purpose. The end unit assessment will be considered summative when it is done at end of unit and want to start a new one.

It will be formative assessment, when it is done in order to give information on the progress of pupils and from there decide what adjustments need to be done.

The assessment done at the end of the term, end of year, is considered as summative assessment so that the teacher, school and parents are informed of the achievement of educational objective and think of improvement strategies. There is also end of level/ cycle assessment in form of national examinations.

When carrying out assessment?

Assessment should be clearly visible in lesson, unit, term and yearly plans.

- Before learning (diagnostic): At the beginning of a new unit or a section of work; assessment can be organized to find out what pupils already know / can do, and to check whether the pupils are at the same level.
- During learning (formative/continuous): When pupils appear to be having difficulty with some of the work, by using on-going assessment (continuous). The assessment aims at giving pupils support and feedback.
- After learning (summative): At the end of a section of work or a learning unit, the Mathematics teacher has to assess after the learning. This is also known as Assessment of Learning to establish and record overall progress of pupils towards full achievement. Summative assessment in Rwandan schools mainly takes the form of written tests at the end of a learning unit or end of the month, and examinations at the end of a term, school year or cycle.

Instruments used in assessment.

- **Observation:** This is where the Mathematics teacher gathers information by watching pupils interacting, conversing, working, playing, etc. A teacher can use observations to collect data on behaviours that are difficult to assess by other methods such as attitudes, values, and generic competences and intellectual skills. It is very important because it is used before the lesson begins and throughout the lesson since the teacher has to continue observing each and every activity.
- **Questioning**
 - a) Oral questioning: a process which requires a pupil to respond verbally to questions;
 - b) Class activities/ exercises: tasks that are given during the learning/ teaching process;
 - c) Short and informal questions usually asked during a lesson;
 - d) Homework and assignments: tasks assigned to pupils by their tutors to be completed outside of class.

Homework assignments, portfolio, project work, interview, debate, science fair, Mathematics projects and Mathematics competitions are also the different forms/ instruments of assessment.

1.2.5. Teaching methods and techniques that promote active learning in mathematics

The different learning styles for pupils can be catered for when the teacher uses active learning whereby pupils are really engaged in the learning process.

a) The main teaching methods used in mathematics are the following:

- **Active methods:** they involve the learning through the process of use and discovery, doing things and finding out things using a range of media, solving problems, and planning own work and learning, rather than just listening or reading.
- **Dogmatic method:** the teacher tells the pupils what to do and how to attempt. It is sometimes used when pupils need an example before applying what they learn. For example when introducing the conversion of units of measurements.
- **Inductive-deductive method:** Inductive method is to move from specific examples to generalization and deductive method is to move from generalization to specific examples. In lower primary, inductive is more appropriate as pupils start by observing concrete objects before generalizing what they see.
- **Skills Laboratory method:** Laboratory method is based on the maxim “learning by doing.” It is a procedure for stimulating the activities of the pupils and to

encourage them to make discoveries through practical activities. For example, pupils can measure the total length of square's sides before concluding on how to find its perimeter.

- **Problem solving method.**

The following are some active techniques to be used in Mathematics:

- Group work
- Research
- Probing questions
- Practical activities (drawing, plotting, tabulation, interpreting pictographs)
- Modelling
- Brainstorming
- Quiz Techniques
- Discussion technique
- Scenario building technique.

The CBC enhances the use of actives methods of teaching.

b) What is Active learning?

Active learning is a pedagogical approach that engages pupils in doing things and thinking about the things they are doing. Pupils play the key role in the active learning process. They are not empty vessels to fill but people with ideas, capacity and skills to build on for effective learning. Thus, in active learning, pupils are encouraged to bring their own experience and knowledge into the learning process.

The role of the teacher in active learning	The role of pupils in active learning
<ul style="list-style-type: none"> – The teacher engages pupils through active learning methods such as inquiry methods, group discussions, research, investigative activities, group and individual work activities. – He/she encourages individual, peer and group evaluation of the work done in the classroom and uses appropriate competence-based assessment approaches and methods. 	<p>A pupil engaged in active learning:</p> <ul style="list-style-type: none"> – Communicates and shares relevant information with peers through presentations, discussions, group work and other learner-centred activities (role play, case studies, project work, research and investigation); – Actively participates and takes responsibility for his/her own learning; – Develops knowledge and skills in active ways;

<ul style="list-style-type: none"> - He provides supervised opportunities for pupils to develop different competences by giving tasks which enhance critical thinking, problem solving, research, creativity and innovation, communication and cooperation. - The teacher supports and facilitates the learning process by valuing pupils' contributions in the class activities. 	<ul style="list-style-type: none"> - Carries out research/investigation by consulting print/online documents and resourceful people, and presents their findings; - Ensures the effective contribution of each group member in assigned tasks through clear explanation and arguments, critical thinking, responsibility and confidence in public speaking - Draws conclusions based on the findings from the learning activities.
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c) Main steps for a lesson in active learning approach

All the principles and characteristics of the active learning process highlighted above are reflected in steps of a lesson as displayed below. Generally, the lesson is divided into three main parts whereby each one is divided into smaller steps to make sure that pupils are involved in the learning process. Below are those main parts and their small steps:

1) Introduction

Introduction is a part where the teacher makes connection between the current and previous lesson through appropriate technique. The teacher opens short discussions to encourage pupils to think about the previous learning experience and connect it with the current instructional objective. The teacher reviews the prior knowledge, skills and attitudes which have a link with the new concepts to create good foundation and logical sequencings.

2) Development of the new lesson

The development of a lesson that introduces a new concept will go through the following small steps: discovery activities, presentation of pupils' findings, exploitation, synthesis/summary and exercises/application activities.

❖ Discovery activity

Step 1

- The teacher discusses convincingly with pupils to take responsibility of their learning
- He/she distributes the task/activity and gives instructions related to the tasks (working in groups, pairs, or individual to instigate collaborative learning, to discover knowledge to be learned)

Step 2

- The teacher let pupils work collaboratively on the task;
- He/she then monitors how pupils are progressing towards the knowledge to be learned and boosts those who are still behind (but without communicating to them the knowledge).

❖ **Presentation of student-teachers' findings/productions**

- In this episode, the teacher invites representatives of groups to present their productions/findings.
- After three/four or an acceptable number of presentations, the teacher decides to engage the class into exploitation of pupils productions.

❖ **Exploitation of pupils' findings/ productions**

- The teacher asks pupils to evaluate the productions: which ones are correct, incomplete or false;
- Then the teacher judges the logic of the pupils' products, corrects those which are false, completes those which are incomplete, and confirms those which are correct.

❖ **Institutionalization or harmonization (summary/conclusion/ and examples)**

The teacher summarizes the learned knowledge and gives examples which illustrate the learned content.

❖ **Application activities**

- Exercises of applying processes and products/objects related to learned unit/sub-unit
- Exercises in real life contexts;
- The teacher guides pupils to make the connection of what they learnt to real life situations. At this level, the role of teacher is to monitor the fixation of process and product/object being learned.

3) Assessment

In this step the teacher asks some questions to assess achievement of instructional objective. During assessment activity, pupils work individually on the task/activity. The teacher avoids intervening directly. In fact, results from this assessment inform the teacher on next steps for the class and individuals. In some cases, the teacher can end with a homework/ assignment. Doing this will allow pupils to relay their understanding on the concepts covered that day. Teacher leads them not to wait until the last minute for doing the homework as this often results in an incomplete homework set and/or an incomplete understanding of the concept.

1.2.6 Stages of concept development in lower primary

There are 3 main stages for concept development in mathematics for lower primary: Concrete stage, semi concrete and abstract stage.

- **Concrete stage:** In this stage, the teacher begins the lesson by modelling each mathematical concept with concrete materials. In other words, this stage is the “doing” stage, using concrete objects to model problems. Those materials are real objects that learners manipulate and discuss how to use them for better learning.
- **Semi- concrete stage, visualization or representation:** In this stage, the teacher transforms the concrete model into a representational (semi-concrete) level, which may involve drawings or pictures; using circles, dots, and tallies; or using pictures for counting. In other words, this is the “seeing” stage that uses representations of the objects to model problems.
- **Abstract stage:** In this stage, the teacher models the mathematics concept at a symbolic level, using only numbers, notation, and mathematical symbols to represent the number of circles or groups of circles. The teacher uses operation symbols (+, −, ×, ÷) to indicate addition, multiplication, or division. This is the “symbolic” stage, where students are able to use abstract symbols to model problems.

1.2.7 Teaching and learning in the second language

A Rwandan child enters school with the accumulated experience of his/her pre-school years (ECD Centers and Nursery school) in the Kinyarwanda language which is also used at home. The child has already absorbed and processed few amounts of information about the Kinyarwanda language and customs of his/her society and the variety of objects and experiences that his/her environment offers: objects, houses, animals, trees, etc. Other experiences can be gotten “from outside” through the radios or TV and they are equally part of his everyday life.

As the child enters the Primary one (P1), the Kinyarwanda teacher will have to guide the child to deepen this information because the medium of instruction for other subjects is the English, a second language for the child.

The Mathematics teacher is well instructed to use a Mathematics syllabus, He/she will need to reflect to the Rwandan context and use concrete objects and illustrations from real life experience of the child to help this child reflect to his/her environment and motivate him/her to enjoy school at first and to discover new experiences.

This means that the pupil will need to learn the content and the language at the same time where both the subject matter and the foreign language (L2) are

developed simultaneously and gradually, depending on the age of pupil and other variables.

The method related to this way of teaching is called Content and Language Integrated Learning (CLIL) (O'Malley and Chamot, 1990).

As a teacher, the following elements are emphasized during CLIL:

Presentation:

Introduce to the classroom a theme related to the concept you want to develop. Use concrete objects, pictures, graphics, and multimedia materials and write keywords on the chalk board.

New words and expressions are to be written in colours, circled or underlined on the chalkboard to watch out for.

Communication:

Boost your pupils' ability to communicate while also allowing them to focus on learning the Mathematics concept. In this regards, learners can be helped to use short sentences to express their ideas. Along the way, you'll build their positive vibes for the target concept and its application in the real life. So, the best strategy is to aim for communicating rather than accuracy when your pupils exchange ideas during the discussion.

Feedback and conclusion:

It is sometimes necessary not to interrupt students during activities, even when their language may not be completely accurate. This may break the flow of the activity and may even cause pupils to lose their confidence. Rather, take notes and try to recap each activity by giving pupils language-and content-related feedback. To let them benefit all the pupils, try to give feedback to the entire class rather than to pupils individually.

Later, ask for feedback from pupils, monitor results and adjust accordingly.

Mathematics teaching strategies in the second language

Basic classification of teaching strategies was provided by O'Malley and Chamot (1990): Cognitive strategies, Meta-cognitive strategies, Social strategies and Affective strategies.

1) Cognitive strategies

- **Contextualization:** Placing the task into a meaningful mathematical or real life experiences for the child. For example, the teacher can use word problems or scenarios involving objects or animals frequently seen by the child in the family or at school.

- **Resourcing:** Using local teaching and learning materials and text books with simplified and adapted activities to the level of understanding for pupils.
- **Elaboration and transfer:** Relating new information to prior knowledge where the new concept must be built basing on the prerequisites, relating new information to the previous ones, making meaningful personal association to information presented where pupils are asked to provide their own examples and point of views. Therefore, guide the learner to use previously acquired knowledge to facilitate a new task.
- **Substitution:** Where necessary, *one can* select alternative approaches and revise the plan to accomplish a task; For example the use of induction and recombination.

2) Meta-cognitive strategies

- **Problem identification:** for example in a word problem, help the learner to explicitly identify the central points which need resolution in a task: you can use pictures or highlight key words in the problem.
- **Self-management:** Understanding and arranging for the conditions that help accomplish the task successfully. This requires that after identifying the question (requested information), one organizes data and thinks of the way of solving towards the solution.
- **Self-monitoring:** Checking, verifying or correcting one's comprehension or performance in the course of problem solving. This requires to verify if the answer you find can justify the mathematics sentence given.

3) Social strategies

- **Cooperation:** Working with others to guide problem solving. Learners are guided to work in groups or in pairs where they can feel free to discuss and explain to each other in the simple language or in their mother tongue.
- **Mediation:** Asking questions for clarification. Learners are given opportunity to feel free to ask questions any time for they need more clarification.

Therefore, there are techniques that can be used by the teacher to **explain concepts and content:**

- **Use visualization techniques:** graphs, hand-on-manipulatives, body language, gestures or computer simulation programmes can help students better understand the concepts.
- **Use an active discovery technique:** instead of giving lengthy explanations in the foreign language about the new concepts, try involving your students in hand-on manipulative activities which can include listening, speaking, reading, writing, watching, cutting, gluing, experimenting, selecting, drawing, etc.

- **Allow students a small time to discuss** in groups or work on content concepts in their mother tongue at the beginning stages when they carry out a task, and they are required to interact or negotiate with their peers.
- **Review the key vocabulary and key content concepts:** you can either display them, use brief quizzes in the form of games or use songs and chants which involve the concept to provide quick and engaging ways of reminding the students of the key concepts and words.
- **Regularly check understanding and give feedback:** observe the students' responses systematically and use the spot-check activities during the lesson.

Learning strategies

The teacher has to carefully organize good environment where all learning strategies will be catered. For Oxford (1990, p. 8), learning strategies are specific actions taken by the learner to make learning easier, faster, more enjoyable, more self directed, more effective and more transferable to new situations.

Teaching Mathematics using a second language may be a challenge for pupils and teachers but there are a number of strategies that support the teacher in Primary Education, such as **holistic, constructive and experiential learning**.

The 21st century pedagogies also often enhance active, experimental, digital and cooperative learning, as well as learning through discovery and task-based learning.

- Holistic learning refers to learning that integrates all subject areas and aims at supporting the child in his social, psychological, physical and cognitive development. This is done in the interest “of more vital and meaningful learning”. For example when teaching the addition of numbers, the teacher can use different contexts: putting countable objects together, adding money in a bank, adding the number of animals in a farm, number of people in the market, etc.
- Constructive learning is often presented as a discovery and construction of mental schema by learners interacting with their environment on multiple levels.

E.g. take 27 bottle tops and ask learners to form 9 groups of them where all groups will have a same number of bottle tops. Ask them to give the number of bottle tops for each group and explain if what they did is the representation of $27 \div 9$ or 27×9 .

- Experiential learning is a tactile approach, which involves physical objects as resources. Its focus is on promoting authentic experience. The level of authenticity is increased if the experience can be shared with an expert.

E.g. If students are learning the perimeter of a rectangle, they may explore the total length of a rectangular field located at their school.

- **Active learning** involves learning through the process of use and discovery, doing things and finding out things for themselves using a range of media, solving problems, and planning own work and learning, rather than just listening or reading.
- **Digital learning** involves the confident and critical manipulation of multiple modalities in diverse media devices. E.g. A guided research on the internet on how to draw a right angle ruler and protractor or a ruler and a pair of compass.
- **Cooperative learning** encourages pupils to work together (in pairs, small groups, class, with another class, school, with several schools). Teachers should monitor how children act and react in group settings, can talk effectively to one another, etc.

E.g. Students collaborate in making a book together on local fauna by colouring 3 animals each in the book. Students exchange their books with students in other classes or schools

- **Discovery learning** is a learning experience that allows children to develop their own understanding and knowledge of concepts and/or relationships rather than following a pre-set process or outcome.

Example: Engaging children in collecting information about the place they live in by, for example, taking photos of the places they want to include in their project.

- **Task-based learning** (TBL) or activity based learning is learning that develops around tasks that students have to complete. The language they will use is determined by what they need to do the task. TBL is generally organized in: pre-task, task, planning how to do the task and report by analyzing and practicing. **Example:** when the teacher needs to teach obtuse angle and acute angles, he/she can give learners protractors and a collection of sheets of paper on which angles are drawn, Learners are asked to group angles in 3 groups: angles with values equal to the right angle, angles whose values are greater than a right angle and angles that are greater than a right angle. Then, learners can be asked to guess the name to be given to the 2 types of angles.

PART II: SAMPLE LESSON

School Name: Primary School

Teacher's name: ...

Term	Date	Subject	Class	Unit N°	Lesson N°	Duration	Class size
1	22 /01/2020	Mathematics	P3	1	1 of 22	7h20-8h00	45 learners
Type of Special Educational Needs to be catered for in this lesson and number of learners in each category				4 slow learners, 2 learners with physical impairment and 5 talented learners.			
Unit title		Numbers from 0 up to 2000					
Key Unit Competence:		To be able to count, read, write, order, compare, add, multiply and divide numbers from 0 to 2000.					
Title of the lesson		Reading and writing numbers from 0 to 2000.					
Instructional Objective		Basing on numbers written on the chalk board, manila paper or number cards, Learners will be able to read loudly and write correctly, confidently and in a given time numbers from 0 to 2000.					
Plan for this Class (location: in / outside)		In the classroom, desks are arranged in a way that help learners to work individually and in small groups.					
Learning Materials (for all learners)		Manila paper, numeration table, number cards, textbooks.					
References		Mathematics P3 learner's book, Mathematics P3 teacher's guide, Mathematics syllabus for Lower primary.					

Steps and Timing	<i>Description of teaching and learning activity</i>		Competences and Cross-Cutting Issues to be addressed
	Teacher's activities	Learners activities	
Introduction or Review (5 minutes)	Give learning materials to pupils, explain them the learning instructions, form groups of learners: complete numbers in the numeration table, read the numbers they write, then read numbers written on the number cards.		
	Provide simple questions on reading and writing numbers not less than 1000.	Observe and read numbers from number cards and write them in words or in figures	When learners are reading and writing numbers in words they develop communication skills.

<p>Development of the lesson (25 minutes)</p> <p>Discovery activities:</p>	<p>Activity 1:</p> <ul style="list-style-type: none"> – Distribute number cards to learners; – Provide instructions; – Ask learners to observe the table of place value hung in the classroom or drawn on the board; – Give 10 numbers between 1000 and 2000 and ask learners to write them in the table of place values; – Ask learners one by one to read loudly these numbers; – Ask each learner to write in word the number that is just read. – Approach each slow learner and guide him/her on how to make it in a simple way. 	<p>Activity1:</p> <ul style="list-style-type: none"> – Listen to instructions and ask question where necessary; – Take learning materials and observe and discuss the table of place values; – Read the given number and complete them in the table of place values: 1256; 1589; 1876; 1943. – Write in words the given numbers in their notebooks. 	<p>Cooperation developed through working together in group.</p> <p>Communication developed through reading numbers and the presentation of their findings.</p> <p>Peace and value addressed when all learners share ideas in a peaceful way with respect of others views.</p>
<p>Engagement and</p>	<p>Activity 2:</p> <ul style="list-style-type: none"> – Form groups of learners and give them instructions on the activity; 	<p>Activity 2:</p> <ul style="list-style-type: none"> – Join groups as requested, Listen to instructions and ask question where necessary; 	<p>Gender addressed when both girls and boys working together in groups or when each accepts the role of presenting the findings of a group.</p>

<p>Presentation of findings</p>	<ul style="list-style-type: none"> – Provide to each group number cards with numbers between 1000 and 2000; – Ask each group to complete their numbers in a table of place values; – Monitor how learners are implementing instructions and how they are working in their groups; – Ask each group to present their findings to the class and ask other pupils to comment. – Approach each slow learner and guide him/her on how to make it in a simple way. 	<ul style="list-style-type: none"> – Take learning materials, draw the table of values; – Read the their numbers and complete them in a table of place values; – be sure that each member is able to present their work;. – Present the work to the class; – Provide comment on presentation where necessary. 	<p>Inclusive education addressed in classroom by encouraging all learners to be engaged on the work and discussion.</p>
<p>Application</p>	<p>Activity 3:</p> <ul style="list-style-type: none"> – Provide to learners numbers between 100 and 2000 to be written (in figure) in the table of values and to write them in words; – Verify if every learner is doing the activity and whether the table of values is well drawn; 	<p>Activity 3:</p> <p>Work out the activity and show the work to the teacher for feedback.</p>	

	<ul style="list-style-type: none"> - Provide more exercises to gifted learners; - Mark the work for learners 		
Synthesis and summary	<ul style="list-style-type: none"> - Invite learners to summarize new elements or concept they learnt; <p>Help them to conclude appropriately;</p> <ul style="list-style-type: none"> - Provide the activity of writing numbers in the table of place values, reading them loudly and writing them in words on the chalk board - Provide a home work to be done. 	<ul style="list-style-type: none"> - Summarize the new elements learnt: <p>reading and writing a number which not greater than 2000; complete such a number in a table of values, writing the number in words.</p> <ul style="list-style-type: none"> - Answer confidently to questions; - Copy the homework and be ready to do it. 	
Observation	<p>Basing on how learners performed their activities, I confirm that my objectives were achieved.</p> <p>Or I take the decision of re-teaching this lesson to improve how to write numbers in words.</p> <p>I appreciate learners' participation and engagement in the lesson.</p>		

1.1 Key unit competence

To be able to count, read, write, order, compare, add, multiply and divide numbers from 0 to 2000

1.2 Prerequisite

Pupils will easily learn this unit, if they have a good background on the following: to count, read, write, order, compare, add, subtract, multiply and divide numbers from 0 to 1000.

1.3 Cross-cutting issues to be addressed

- **Gender balance:** provide equal opportunity to boys and girls in the lesson
- **Inclusive education:** promote education for all learners in the teaching and learning activities.
- **Environment and Sustainability:** This will be addressed when pupils will be maintaining hygiene for their classroom and materials they used.
- **Financial Education:** addressed when pupils discuss word problem involving how to use money and how to manage learning materials or how to prepare activity plan.
- **Peace and Values Education:** addressed when pupils are encouraged to work collaboratively and peacefully in their group.

1.4. Sub-headings /list of lessons

Unit 1: Numbers up to 2000 (40 periods)			Reinforcement and Extension	
	Lesson title	Learning objectives	Number of periods	
1	Introductory activity	Arouse the curiosity of learners on the content of unit 1 and the importance of counting, reading and writing numbers.	1	
2	Reading numbers up to 2000	Read the numbers in figures up to 2000.	1	
3	Writing numbers in figures up to 2000	Write numbers in figures up to 2,000 .	1	

4	Place value of digits of a number up to 2000.	Write and say the place value of a digit of a number up to 2000.	1	1
5	Expanded form of a number between 100 and 2000	Write the expanded form of numbers up to 2000	1	1
6	Remediation	Provide learning support to learners who are falling behind their peers	1	
7	Writing numbers in words up to 2000	Write numbers in words up to 2 000 .	1	
8	Comparing numbers less than or equal to 2000	Compare numbers less than or equal to 2000.	1	
9	Arranging numbers less than or equal to 2 000 in ascending order and in descending order.	Arrange numbers less than or equal to 2 000 in ascending or descending order.	1	1
10	Addition without carrying of numbers whose sum does not exceed 2000.	Add without carrying the numbers whose sum does not exceed 2000	2	1
11	Remediation	Provide learning support to learners who are falling behind their peers	1	
12	Addition with carrying of numbers whose sum does not exceed 2000	Add with carrying numbers whose sum does not exceed 2000.	1	1
13	Word problems involving addition of numbers whose sum does not exceed 2000	Solve word problems involving addition of numbers whose sum does not exceed 2000.	1	
14	Subtraction without borrowing of numbers less than or equal to 2000	Subtract numbers within 2000 without borrowing.	1	
15	Subtraction with borrowing of numbers less than or equal to 2,000	Subtract numbers within 2000 with borrowing.	2	1
16	Remediation	Provide learning support to learners who are falling behind their peers	1	

17	Word problems involving subtraction of numbers less than or equal to 2 000	Solve word problems involving subtraction of numbers less than or equal to 2 000.	1	1
18	Multiples of 7 up to 70	Explore multiples of 7 that do not exceed 70.	1	
19	Multiples of 8 up to 80	Explore multiples of 8 that do not exceed 80.	1	
20	Multiples of 9 up to 90	Explore multiples of 9 that do not exceed 90.	1	
21	Multiplication of a number by a single digit number (7,8 or 9) where the product does not exceed 2,000	Multiply a number by a single digit number (7, 8 or 9) where the product does not exceed 2000.	1	1
22	Remediation	Provide learning support to learners who are falling behind their peers	1	
23	Multiplication of a 3 digit number by a 2 digit number where the product does not exceed 2,000	Multiply a 2 or 3 digit number by a 2 digit number where the product does not exceed 2000.	1	1
24	Word problems involving multiplication of a 3-digit number by a 2-digit number	Solve word problems involving multiplication of a 3-digit number by a 2-digit number.	1	
25	Multiplication by 100 or 1000 where the product does not exceed 2,000	Multiply a number by 100 or 1000 where the product does not exceed 2,000.	1	
26	Division without a remainder of a 4 digit number less than 2000 by a one digit number	Divide a 4-digit number less than 2000 by a one-digit number without a remainder.	1	1
27	Word problems involving the division without a remainder	Solve word problems involving the division without a remainder	1	
28	End unit assessment	Count, read, write, order, compare, add, multiply and divide numbers up to 2000.	1	
			30	10

1.5 Guidance on different lessons

Lesson 1: Introductory activity 1

- Invite pupils to read the story of Mugarura who does not know the quantity of cabbages produced in his field.
- Guide pupils to discuss the reason why that farmer does not know the number of cabbages;
- Ask them to suggest what is required for everyone to be able to count the quantity of objects;
- Move around in the classroom to get aware of different suggestions and ask some probing questions where necessary.
- Invite all pupils to a class discussion. Basing on their experience, prior knowledge and abilities shown in answering questions for this activity open a discussion with probing questions to guide them to give answers.
- Harmonize answers for pupils and arouse their curiosity on what is going to be learnt in this unit so that they may be able to manage different quantities of their properties.

Lesson 2: Reading numbers up to 2 000

a) Objectives:

Read the numbers in figures up to 2000.-

b) Teaching resources and learning resources

- Number cards with different digits
- Number cards made by different numbers between 1000 and 2000 in different colors;
- Different types of counters.

c) Teaching and learning activities:

- Provide number cards made by different numbers between 1000 and 2000
- Show number cards of (or write on the chalk board) numbers between 1000 and 2000 and use different probing questions to guide pupils how to read those numbers (use activity1.1.1 and Activity 1.1.2).
- Form groups of pupils and give them digit cards with 0, 1,2, 3, 4, 5, 6, 7, 8,9;
- Ask each group to use digit cards and form a 4 digit number between 1000 and 2000 and ask them to read a formed number; (see Activity 1.1.3).
- Move around in the class for facilitating pupils and where necessary give more clarifications reminding them to fix the first card with the number 1.

d) Synthesis/summarization

Guide pupils to read aloud the numbers below 2 000 written in figure.

e) Assessment

Put number cards with numbers between 1000 and 2000 in a basket and ask each pupil to pick randomly one card, read its number. (use Application activity 1.1).

f) Answer for activities

Activity 1.1.1:

Guide pupils to read numbers correctly.

Activity 1.1.2:

Guide pupils to read numbers correctly

Application activity 1.1

Guide each Pupil to pick a card and read aloud the number on it to his/her colleague.

Lesson 3: Writing numbers up to 2000 in figures

a) Objectives: Write numbers up to 2 000 in figures.

b) Teaching resources and learning resources

- Number cards with different digits
- Number cards made by different numbers between 1000 and 2000 in different colors;
- Different types of counters.

c) Teaching and learning activities:

- Form groups of pupils and give them number cards with different digits or write on the chalk board some digits (use activity1.2.1).
- Ask each group to use the given digits and form a 4 digit number between 1000 and 2000 and then write a formed number in their notebook;
- Move around in the class for facilitating pupils and where necessary give more clarifications reminding them to fix the first card with the number 1.
- choose randomly a group to read aloud their formed numbers
- Guide pupils to be able to fill in the missing numbers on number line and read aloud the written numbers. (use Activity 1.2.2).
- Select one formed group to present before others

a) Synthesis/summarization

Guide pupils to write in figures the numbers below 2 000.

b) Assessment

- Guide pupils to write correctly the missing numbers and to form numbers using number cards (see Application activity 1.2).
- Move around in the class for facilitating pupils to form 4 different numbers between 1000 and 2000
- Guide learners to read their written numbers.

c) Answer for activities

Activity 1.2.1:

To make 4 numbers between 1 000 and 2 000, using number cards given, guide pupils to fix the first card which is 1. Pupils will make many different numbers, as a teacher, verify if each pupil makes numbers which are between 1 000 and 2 000.

The following are examples of numbers which can be formed:

- 1) **1 974:** One thousand nine hundred and seventy-four;
1 947: One thousand nine hundred and forty-seven;
1 794: One thousand seven hundred and ninety-four
- 2) **1 687:** One thousand six hundred and eighty-seven.
1 678: One thousand six hundred and seventy-eight
1 876: one thousand eight hundred and seventy-six.
- 3) **1 892:** One thousand eight hundred and ninety-two.
1 829: One thousand eight hundred and twenty-nine.
1 928: One thousand nine hundred and twenty-eight.
- 4) **1 957:** One thousand nine hundred and fifty-seven.
1 975: One thousand nine hundred and seventy-five.
1 597: One thousand five hundred and ninety-seven.

Activity 1.2.2:

- a) **1 100:** One thousand one hundred;
1 300: One thousand three hundred;

1 500: One thousand five hundred;
1 700: One thousand seven hundred;
1 900: One thousand nine hundred.

b) **200:** Two hundred;
400: Four hundred;
600: Six hundred;
800: Eight hundred;
1000: One thousand.

c) **200:** Two hundred;
500: Five hundred;
800: eight hundred;
1 100: One thousand, one hundred;
1 400: One thousand, 4 hundred.

Application activity 1.2

Guide pupils to write in figures and to read numbers correctly:

- 1) a) numbers between 1 990 and 2 000 are the following: 1 991; 1 992; 1 993; 1 994; 1 995; 1 996; 1 997; 1 998; 1 999.
b) numbers between 1 240 and 1 250 are the following:
1241; 1 242; 1 243; 1 244; 1 245; 1 246; 1 247; 1 248; 1 249;
- 2) Put number cards with numbers between 1000 and 2000 in a basket and ask any pupil to pick randomly one card and read aloud its number; as a teacher, verify if each pupil makes numbers which are between 1 000 and 2 000.
- 3) Guide pupils to read correctly the given numbers.
 - a) 1 924: One thousand nine hundred and twenty-four
 - b) 1 499: One thousand four hundred and ninety-nine

Lesson 4: Place value of digits of numbers up to 2000

a) Objectives

Write and say the place value of a digit of a number up to 2000.

b) Teaching resources and learning resources

- Abacus
- The table of place values;
- Number cards with different numbers between 1000 and 2000 in different colors;
- Different types of counters.

c) Teaching and learning activities:

- Ask pupils to draw a table of place value in their notebooks,
- Ask them to compare their table and the table which is in the pupil's book on activity 1.3.1;
- Provide to pupils abacus with different numbers between 1000 and 2000 and ask each one to try to complete each number in his table referring to the example found in activity 1.3.1;
- Form groups of pupils and assign them to do activity 1.3.2,
- Move around in the class for facilitating pupils where necessary;
- Invite some groups to present their findings and then help them to harmonize;
- Assign the same groups to do activity 1.3.3 and move around to each group to verify their performance.

d) Synthesis/summarization

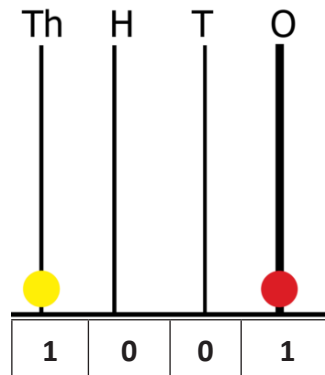
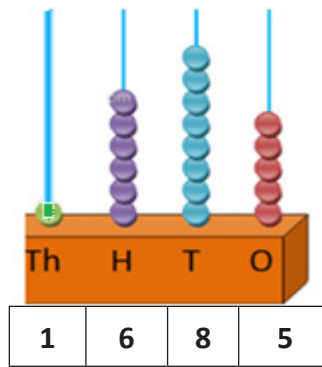
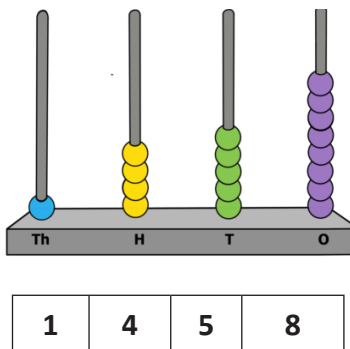
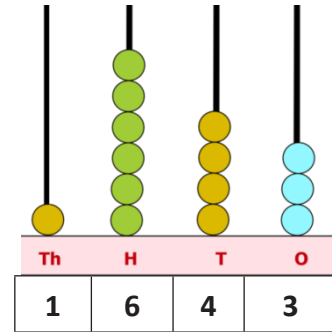
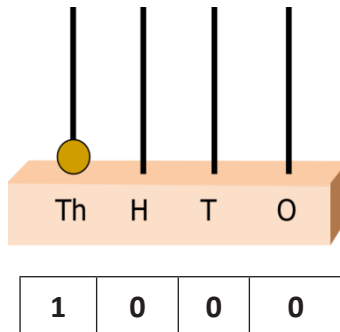
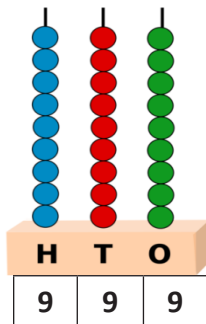
Guide pupils to summarize how to draw a table of place value, how to complete a number in such a table and how to partition that number into thousands (Th), hundreds (H), tens (T) and ones (O).

e) Assessment

- Provide application activities to be done by pupils (refer to application activity 1.3) and check their answers ;
- Assign all pupils homework.

f) Answer for activities

Activity 1.3.1:



Activity 1.3.2:

Thousands	Hundreds	Tens	Ones
1	4	5	6
1	2	3	9
1	6	9	9
1	4	7	9
1	9	5	3
1	9	7	4

Guide pupils to be able to explain the decomposition for each number like in the answer of activity 1.3.2.

Activity 1.3.3

- 1996 = 9Tens, 1Thousand, 6 Ones, 9 Hundreds.
- 1759 = 7Hundreds, 9Ones, 1Thousand, 5 Tens.
- 1239 = 9Ones, 2Hundreds, 3Tens, 1Thousand.
- 1197 = 9Tens, 1hundreds, 1Thousand, 7Ones.
- 1597 = 5 hundreds, 7Ones, 1Thousand, 9 Tens.

Application activity 1.3

- 1) a) 9 stands for Tens b) 3 stands for Hundreds
 c) 9 stands for tens d) 1 stands for thousands
- 2) a) 1 999 b) 1 649 c) 1 395 d) 1 957 e) 1 295.

Lesson 5: Expanded form of a number between 1000 and 2000

a) Objectives





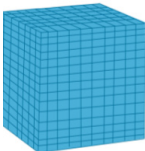
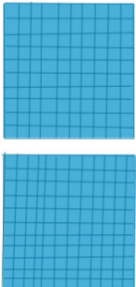
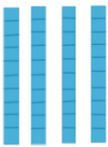

Write the expanded form of numbers up to 2000.

b) Teaching resources and learning resources

- Blocks of thousand, hundreds, tens and ones
- Abacus or table of place values
- Number cards made by different numbers between 1000 and 2000 in different colors;

c) Teaching and learning activities:

- Provide to pupils blocks of thousand, hundreds, tens and ones and form any number between 1000 and 2000.
- Show a group of different blocks and ask pupil to write the related number (refer to **activity1.4.1**).

Number presented by base ten blocks				Expanded form of the number
Thousands 	Hundreds 	Tens 	Ones 	1368 =1000+300+60+8
Thousands 	Hundreds 	Tens 	Ones 	_____

- Form groups of pupils and assign them to expand numbers basing on how to represent a number by the use of base ten blocks (use **activity 1.4.2**).
- Invite one group to present their finding and harmonize their presentation
- Assign the same groups to do **activity 1.4.3**
- Move around in the classroom for facilitating pupils to expand different numbers between 1000 and 2000
- Guide learners when they are writing in figures expanded numbers

d) Synthesis/summarization

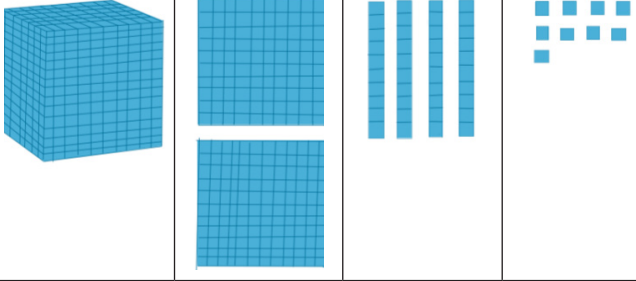
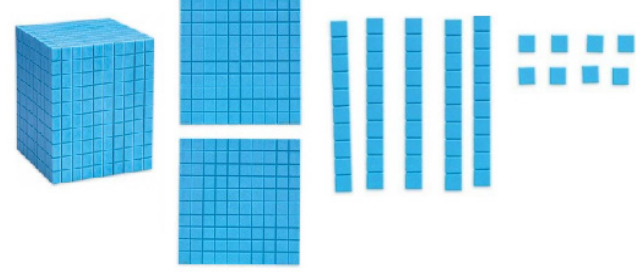
Guide pupils by showing them how a number can be expanded using blocks or table of place values.

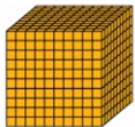
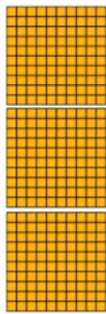
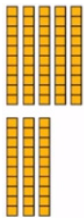

e) Assessment

Provide application activities to be done by pupils (use the application activity 1.4) and check their answers.

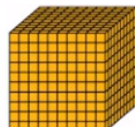
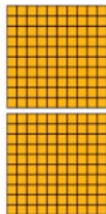
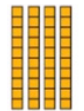


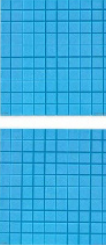


f) Answer for activities

Activity 1.4.1

Number presented by base ten blocks				Expanded form of the number
Thousands	Hundreds	Tens	Ones	
				$1249 = 1000+200+40+9$
				$1258 = 1000+200+50 +8$

Thousands	Hundreds	Tens	Ones	
				$1382 = 1000+300+80+2$

Activity 1.4.2

Thousands	Hundreds	Tens	Ones	
				<p>1 thousand 2 hundreds 4 tens 2 ones</p> <p>$=1000+200+40+2$</p> <p>$= 1242$</p>
				<p>$= 1 \text{ thousand } 2 \text{ hundreds } 5 \text{ tens } 8 \text{ ones}$</p> <p>$=1000+200+50+8$</p> <p>$=1258$</p>

Activity 1.4.3

$1242 = 1 \text{ thousands } 2 \text{ hundreds } 4 \text{ tens } 2 \text{ ones} .$

In the expanded form, $1242 = 1000+200+40+2$

Application activity 1.4

1) $1675 = 1 \text{ Thousands } 6 \text{ Hundreds } 7 \text{ Tens } 5 \text{ Ones} .$

2) $1874 = 1000+800+70+4$

Then $1874 = 1 \text{ thousand } 8 \text{ hundreds } 7 \text{ tens } 4 \text{ ones}$

3) a) $1265 = 1 \text{ thousand } 2 \text{ hundreds } 6 \text{ tens } 5 \text{ ones}$

b) $1799 = 1 \text{ thousand } 7 \text{ hundreds } 9 \text{ tens } 9 \text{ ones}$

c) 1 645 = 1 thousand 6 hundreds 4 tens 5 ones

d) 1 436 = 1 thousand 4 hundreds 3 tens 6 ones

e) 1 997 = 1 thousand 9 hundreds 9 tens 7 ones

f) 1 956 = 1 thousand 9 hundreds 5 tens 6 ones.

Lesson 6: Remediation

Organize a lesson in which you *provide learning support to learners who are falling behind their peers.*

Lesson 7: Writing numbers in words up to 2000

a) Objectives

Write numbers in words up to 2000.

b) Teaching resources and learning resources

- Abacus or table of place values
- Number cards made by different numbers between 1000 and 2000 in different colors.

c) Teaching and learning activities

- Ask pupils to expand a number
- From expanded number, ask pupils to show related counter to each block and read aloud (use activity 1.5.1),

Example: Complete by hundred or thousand

$$1236 = 1000 + 200 + 30 + 6 =$$

= One thousand two hundred and thirty-six.

- Form groups of pupils and guide them when writing number in word (use **activity 1.5.2**).
- Move around in the class for facilitating pupils in writing numbers in words
- Ask any group to choose a member to present their findings.
- Moderate the findings presented by pupils.

d) Synthesis/summarization

Guide pupils on how to write a number in words;

When writing a number, you write the number in each period followed by the name of the period without the 's' at the end and insert **“and”** after the first digit in every group of 3 numbers (hundreds) that contain tens or units.

e) Assessment

Provide application activities to pupils from the pupil's book asking them to write numbers in words and read them aloud (see **Application activity 1.5**).

f) Answer for activities

Activity 1.5.1

1236 =	1000	one thousand
+	200	Two hundred
+	30	Thirty
+	6	Six

1236 = One thousand two hundreds and thirty six.

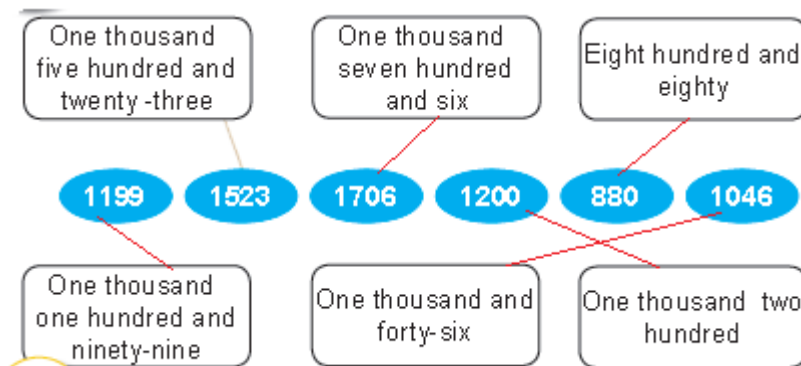
Activity 1.5.2

Number	Expanded form	Number in words
1 795	1000+700+90+5	One thousand seven hundred and ninety-five
1 324	1000+300+20+4	One thousand three hundred and twenty-four
1 299	1000+200+90+9	One thousand two hundred and ninety-nine
1706	1000+700+6	One thousand seven hundred and six

Application activity 1.5

- 1) a) 1239: One thousand two hundred and thirty-nine
- b) 1719: One thousand seven hundred and nineteen
- c) 1456: One thousand four hundred and fifty-six
- d) 1599: One thousand five hundred and ninety-nine

2) Matching



Lesson 8: Comparing numbers less than or equal to 2000

a) Objectives

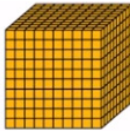
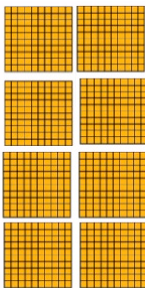
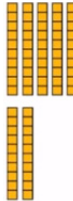

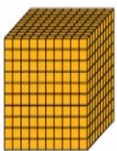
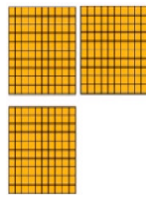
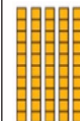

Compare numbers less than or equal to 2000

b) Teaching resources and learning resources

- Abacus or the table of place values;
- Number cards with different numbers between 1000 and 2000 in different colors;
- Different types of counters/ blocks.

c) Teaching and learning activities:

- Ask pupils to draw a table of place value in their notebooks,
- Ask them to represent 2 numbers by using a table of values, abacus or the base ten blocs. Then, invite them to compare the represent numbers by considering the number of beads or the number of blocks for each place value. See the **activity 1.6.1:**

Place values	Th	H	T	O	Th	H	T	O
								
Number	1872				1356			

You can now guide them to prove the reason why $1872 > 1356$.

- Form groups of pupils and assign them to refer to the example of activity 1.6.1 and do activity 1.6.2;
- Move around in the class for facilitating pupils where necessary; assign those who finish before given time to discuss on how to do the activity 1.6.3;
- Invite some groups to present their findings and then help them to harmonize;

d) Synthesis/summarization

Guide pupils to summarize how to compare numbers using a table of place values: Insist on the comparison of thousands (Th), hundreds (H), tens (T) and ones (O).

e) Assessment

- Provide application activities to be done by pupils (use the application activity

1.6) and check their answers;

– Assign all pupils to do the Activity 1.6.5 as homework.

f) Answer for activities

Activity 1.6.1:

Pupils are completing numbers in the table of place values before comparing them.

Activity 1.6.2:

- a) $1\ 356 < 1\ 536$ b) $1\ 905 > 1\ 805$ c) $1\ 037 = 1\ 037$
d) $1\ 709 < 1\ 790$ e) $1\ 206 < 1\ 267$ f) $1\ 670 = 1\ 670$

Activity 1.6.3

- a) $1\ 999 > 1\ 432$ b) $1\ 421 < 1\ 999$ c) $1\ 395 < 1\ 432$
d) $1\ 421 < 1\ 432$ e) $1\ 999 > 1\ 432$

Application activity 1.6

- a) $1\ 905 = 1\ 905$ b) $1\ 714 < 1797$ c) $1\ 926 > 1\ 673$
d) $1\ 532 > 1\ 325$ e) $1\ 647 = 1647$ f) $1\ 351 < 1\ 513$

Lesson 9: Arranging numbers up to 2000

a) Objectives

Arrange numbers less than or equal to 2 000 in ascending or descending order

b) Teaching resources and learning resources

- The table of place values;
- Number cards with different numbers between 1000 and 2000 in different colors;
- Different types of counters.

c) Teaching and learning activities:

- Invite pupils to the whole class discussion to explore how they can compare numbers: they draw a table of place values, complete numbers in the table, compare these numbers and arrange them from the smallest to the largest number.

Thousands	Hundreds	Tens	Ones
1	6	4	9
1	8	3	6
1	5	9	8
1	7	5	2

From the place value table, learners can see the smallest number and the biggest number.

- Give another example where numbers differ at the other place values: tens

or ones.

- Form groups of pupils assign them to work on other questions of the **activity 1.7.1**
- Move around in the classroom for facilitating pupils where necessary;
- Invite some groups to present their findings and then help them to harmonize by explaining how to order numbers from the smallest to the largest (in ascending order).
- Assign the same groups to do **activity 1.7.2** and move around to each group to verify their performance;
- Ask some groups to present answers and then guide them to harmonize by explaining how to order numbers from the largest to the smallest (in descending order).

d) Synthesis/summarization

- Guide pupils to summarize how to arrange numbers in an ascending order and in a descending order. Insist on the use of table of values to guide the comparison and then the arrangement of numbers.

e) Assessment

- Provide application activities to be done by pupils in pair (Application activity 1.7 question 1) and verify their answers;
- Assign homework to all pupils (Application activity 1.7 question 2).

f) Answer for activities

Activity 1.7.1

- a) 1 395, 1 593, 1 953.
- b) 1 136, 1 316, 1 613.

Activity 1.7.2

In descending order: 1 976, 1 967, 1 919, 1 796, 1 769, 1 697, 1 679.

Application activity 1.7

- 1) A) 1 569, 1 596, 1 659, 1 695, 1 956, 1 965
B) 1 457, 1 475, 1 547, 1 574, 1 745, 1 754
- 2) Pupils will use different numbers, as a teacher you have to verify if such numbers are well arranged.

Lesson 10: Addition without carrying of numbers whose sum does not exceed 2000

a) Objectives

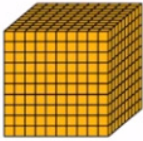
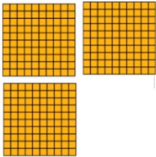
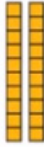

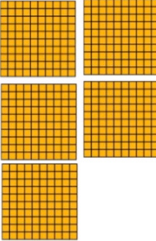
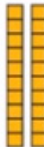

Add without carrying the numbers whose sum does not exceed 2000

b) Teaching resources and learning resources

- The table of place values;
- Number cards with different numbers between 1000 and 2000 in different colors;
- Different types of counters.

c) Teaching and learning activities:

- Invite the whole class and to explore how they can use the abacus or the base ten block to add numbers:

		Thousands	Hundreds	Tens	Ones	Number in figure
	First number					1 3 2 5
+	Second number					5 2 4

- Invite one pupil on the black board and motivate the colleagues (the class) to guide him/her how to add numbers given in example 1 and example 2.
- Form groups of pupils and assign them to do the **activity 1.8.1** where they have to draw a table of place values, complete numbers in the table, refer to the example and add the given numbers.
- Move around in the class for facilitating pupils where necessary;
- Invite some groups to present their findings and then help them to harmonize by explaining how to add numbers using a table of place values. Guide them to discover that this method is the same as *adding vertically or the standard written method*.
- Assign the same groups to do **activity 1.8.2** and move around to each group to verify their performance;
- Ask some groups to present answers and then guide the class to harmonize by explaining how to add numbers *with carrying*.

d) Synthesis/summarization

- Guide pupils to summarize how to add numbers without carrying. Insist on the use of the standards written method which looks like the use of the table of values.

e) Assessment

- Assign pupils to work in pair, do Application activity 1.8 and verify their answers
- Assign homework to all pupils.

f) Answer for activities

Activity1.8.1

a) 1 979 b) 1 999 c) 1 939 d) 1 989 e) 1 998 f) 1 796

Activity1.8.2

- $1\ 124 + 471 = 1\ 595$ • $1\ 542 + 437 = 1\ 979$ • $1\ 005 + 982 = 1\ 987$
- $1\ 321 + 678 = 1\ 999$ • $1\ 234 + 625 = 1\ 859$ • $1\ 213 + 785 = 1\ 998$

Application activity1.8.1

1. a) 1 997 b) 1 909 c) 1 999 d) 1 999 e) 1 978 f) 1693

2. a) 1 677 b) 1 899 c) 1 978 d) 1 996 e) 1 890

Lesson 11: Remediation

Organize a lesson in which you provide learning support to learners who are falling behind their peers.

Lesson 12: Addition with carrying of numbers whose sum does not exceed 2000

a) Objectives

Add with carrying numbers whose sum does not exceed 2000

b) Teaching resources and learning resources


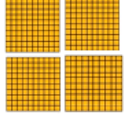
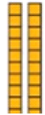

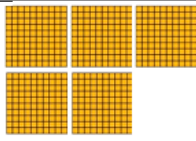
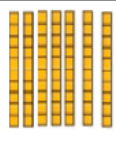

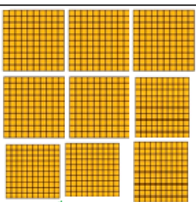
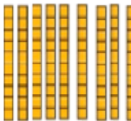

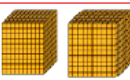
- The table of place values;
- Number cards with different numbers between 1000 and 2000 in different colors;
- Different types of counters.

c) Teaching and learning activities:

- Invite pupils to a class discussion where they take base ten blocks (or abacus

whose beads of different place values have different colors). Guide them how they can add them by carrying.

- From these concrete materials, lead pupils to discover how they can add with carrying the numbers:

First number					1425
Second number					575
Sum					$\begin{array}{r} 111 \\ 1425 \\ + 575 \\ \hline 2000 \end{array}$
Modified Sum					2000

- Form groups of pupils and assign them to do the **activity 1.8.3** where they have to: draw a table of place values, complete numbers in the table, refer to the example and add the given numbers.
- Move around in the class for facilitating pupils where necessary;
- Invite some groups to present their findings and then help them to harmonize by explaining how to add numbers and carry 1 to tens, to hundreds or to thousand. Guide them to discover that this method is the same as adding vertically or the standard written method with carrying.
- Assign the same groups to do **activity 1.8.4** and move around to each group to verify their performance;
- Ask some groups to present answers and then guide the class to harmonize by explaining how to add numbers *with carrying*.

d) Synthesis/summarization

- Guide pupils to summarize how to add numbers with carrying. Insist on the use of the standards written method which looks like the use of the table of values.

e) Assessment

- Assign pupils to work in pair, do **application activity 1.8.2** and verify their answers
- Assign homework to all pupils.

f) Answer for activities

Activity 1.8.3

- a) 1 733 b) 1 966 c) 2 000 d) 1 996

Activity 1.8.4

- $924 + 897 = 1\,821$
- $642 + 858 = 1\,500$
- $952 + 879 = 1\,831$
- $905 + 997 = 1\,902$
- $721 + 999 = 1\,720$
- $834 + 789 = 1\,623$
- $813 + 979 = 1\,792$

Application activity 1.8.2

1. a) 1 955 c) 1 992 e) 1 654
 b) 1 994 d) 1 941 f) 1 715
2. a) 1 851 c) 1 894 e) 1 654
 b) 1 472 d) 1 920 f) 1 933

Lesson 13: Word problems involving addition whose sum does not exceed 2000

a) Objectives

Solve word problems involving addition of numbers whose sum does not exceed 2000

b) Teaching resources and learning resources

- The table of place values;
- Number cards with different numbers between 1000 and 2000 in different colors;
- Different types of counters.

c) Teaching and learning activities:

Concerning **the lesson on word problems involving addition**, you will help pupils to solve a one –step or a two-step problem: guide them to *understand the problem, identify facts (given and requested), draw visual representations and solve the problem using the addition.*

- Start by guiding pupils to solve some problems in a class discussion, provide problems to be solved into groups and then give problems to be solved individually.

Activity 1.9

- 1) Total number of houses: $754 + 969 = 1\ 723$
- 2) Total number of people: $1\ 006 + 979 = 1\ 985$
- 3) The number of all students at school: $997 + 967 = 1\ 964$
- 4) Total number of all patients who received medical care: $799 + 356 + 795 = 1\ 950$

Application activity 1.9

- 1) The Number of people in that hall: $976 + 779 = 1\ 755$
- 2) The number of people for our cell: $357 + 337 + 731 = 1\ 425$
- 3) The total number of all customers: $969 + 656 + 245 = 1\ 870$
- 4) Number of houses constructed in the sector: $675 + 199 + 992 = 1\ 866$.

Lesson 14: Subtraction without borrowing of numbers less than or equal to 2000

a) Objectives

Subtract numbers within 2000 without borrowing


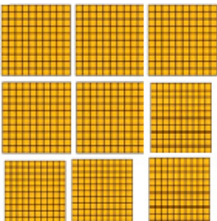
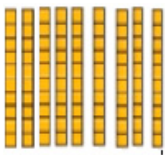

b) Teaching resources and learning resources


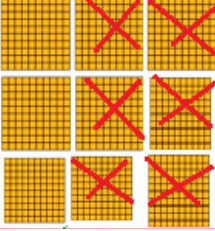
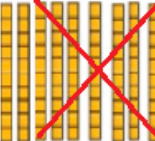

- The table of place values;
- Number cards with different numbers between 1000 and 2000 in different colors;
- Different types of counters and base ten blocks

Use charts of base ten blocks

c) Teaching and learning activities:

- Invite pupils to use abacus or base ten blocks. Guide them how to take away some blocks and ask the number that was represented, the number taken away and the remaining number:

	Thousands	Hundreds	Tens	Ones	Number in figure
First number					1999

Subtract (Take away and count the remaining blocks)					$1999 - 1675$ $= 324$ Vertically $\begin{array}{r} 1999 \\ - 1675 \\ \hline 0324 \end{array}$
--	---	---	---	--	---

- Form groups of pupils and assign them to do the **activity 1.10.1** where they have to: draw a table of place values, complete numbers in the table refer to the example and perform the subtraction;
- Move around in the class for facilitating pupils where necessary;
- Invite some groups to present their findings and then help them to harmonize by explaining how to subtract numbers using a table of place values. Guide them to discover that this method is the same as *subtracting vertically or the standard written method*.
- Assign the same groups to do **activity 1.10.2** and move around to each group to verify their performance;
- Ask some groups to present answers and then guide the class to harmonize by explaining how to subtract a number from another *without borrowing*.

d) Synthesis/summarization

- Guide pupils to summarize how to subtract numbers without borrowing. Insist on the use of the standards written method which looks like the use of the table of values.

e) Assessment

- Invite pupils to work in pair and do application activity 1.10.1 and verify their answers
- Assign homework to all pupils.

f) Answer for activities

Activity 1.10.1

- d) 535 e) 223 a) 432 b) 322 c) 550

Activity 1.10.2

- $1\ 698 - 1\ 426 = 272$ • $1\ 385 - 1\ 274 = 111$ • $1\ 958 - 1\ 327 = 631$
- $1\ 875 - 1\ 352 = 523$ • $1\ 296 - 276 = 1\ 020$
- $1\ 579 - 1\ 156 = 423$ • $1\ 473 - 1\ 062 = 411$

Application activity 1.10.1

1. a) 1 232 c) 900 e) 552
b) 226 d) 1 020 f) 1 033

2. a) 1 122 b) 531 c) 902 d) 352 e) 1 116.

Lesson15: Subtraction with borrowing of numbers less than or equal to 2000

a) Objectives


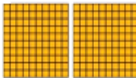
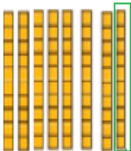
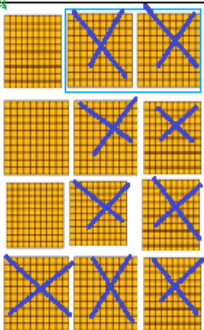


Subtract numbers within 2000 with borrowing

b) Teaching resources and learning resources

- The table of place values;
- Number cards with different numbers between 1000 and 2000 in different colors;
- Different types of counters.

c) Teaching and learning activities:

- Invite pupils to use abacus or bas ten blocks. Guide them how to take away some blocks and ask the number that was represented, the number taken away and the remaining number:
- Use the example given in the **activity 1.10.3** and guide pupils to see that it is necessary to borrow: converting one bead or one block for the next place value in 10 units of the current place value:

Step	Thousands	Hundreds	Tens	Ones	Number in figures
First number					1 2 8 2
First number modified Subtract (take away blocks and count the remaining blocks)					1282 - 967 = 315 <i>Vertically</i> $\begin{array}{r} 12 \quad 12 \\ 0 \quad 7 \\ \underline{1282} \\ - \quad 967 \\ \hline 315 \end{array}$

- Form groups of pupils and assign them to do the **activity 1.10.3** where they have to: draw a table of place values, complete numbers in the table refer to the example and perform the subtraction;
- Move around in the class for facilitating pupils where necessary;

- Invite some groups to present their findings and then help them to harmonize by explaining how to subtract numbers using a table of place values. Guide them to discover that that method is the same as *subtracting vertically or the standard written method*.
- Assign the same groups and provide number cards and give instructions before doing **activity 1.10.4**
- Move around to each group to verify their performance;
- Ask some groups to present answers and then guide the class to harmonize by explaining how to subtract a number from another *with borrowing*.

d) Synthesis/summarization

- Guide pupils to summarize how to subtract numbers with borrowing. Insist on the use of the standard written method which looks like the use of the table of values.

e) Assessment

- Invite pupils to work in pair and do **application activity 1.10.2** and verify their answers
- Assign homework to all pupils.

f) Answer for activities

Activity1.10.3

- a) 264 b) 234 c) 576 d) 825 e) 262.

Activity1.10.4

- $1\ 124 - 1\ 099 = 25$ • $1\ 234 - 978 = 256$ • $1\ 421 - 786 = 635$
- $1\ 005 - 987 = 18$ • $1\ 326 - 879 = 447$ • $2\ 000 - 1\ 979 = 21$
- $1\ 300 - 1\ 299 = 1$

Application activity 1.10.2

1. a) 235 b) 144 c) 38 d) 348 e) 157 f) 553
 2. a) 168 b) 480 c) 800 d) 40 e) 255.

Lesson 16: Remediation

Organize a lesson in which you *provide learning support to learners who are falling behind their peers*.

Lesson17: Word problems involving subtraction of numbers less than or

equal to 2000

a) Objectives

Solve word problems involving subtraction of numbers less than or equal to 2 000

b) Teaching resources and learning resources

- The table of place values;
- Number cards with different numbers between 1000 and 2000 in different colors;
- Different types of counters.
- A chart showing word problems

c) Teaching and learning activities:

Concerning **the lesson on word problems involving subtraction with or without borrowing**, the teacher will help pupils to solve a one –step or a two-step problem: guide them to *understand the problem, identify facts (given and requested), draw visual representations and solve the problem using the subtraction.*

Start by guiding pupils to solve some problems in a class discussion, provide problems to be solved into groups and then give problems to be solved individually.

Activity 1.11

- 1) The number of trees which were grown up:: $1\ 917 - 769 = 1\ 148$
- 2) Mutoni remained with this number of cows: $1\ 231 - 523 = 708$
- 3) The number of the remaining sacks: $1\ 721 - 179 = 1\ 542$

Application activity 1.11

- 1) Number of remaining trees: $2\ 000 - 1\ 099 = 901$
- 2) The number of the remaining bricks: $1\ 911 - 975 = 936$
- 3) The number of pupils who study at the school: $1\ 921 - 124 = 1797$.

Lesson 18: Multiples of 7 up to 70

a) Objectives






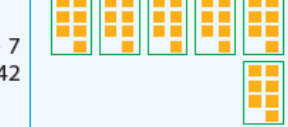

Explore multiples of 7 that do not exceed 70

b) Teaching resources and learning resources

- At least 70 Counters per group;
- Exercise books

c) Teaching and learning activities:

- Form groups of pupils and assign them to do the **activity 1.12.1** where they have to: form at least 10 groups of 7 counters, draw a multiplication table of 7;
- ask each group to combine 2 groups, 3 groups, 4 groups, 9 groups and 10 groups of 7 counters so that at each case they count the number of counters for new combination of groups formed and complete the number in the multiplication table;

7		$1 \times 7 =$
$7 + 7 = 14$		$2 \times 7 =$
$7 + 7 + 7 = 21$		$3 \times 7 =$
$7 + 7 + 7 + 7 = 28$		$4 \times 7 =$
$7 + 7 + 7 + 7 + 7 = 35$		$5 \times 7 =$
$7 + 7 + 7 + 7 + 7 + 7 = 42$		$6 \times 7 =$
$7 + 7 + 7 + 7 + 7 + 7 + 7 = 49$		$8 \times 7 =$

etc.

- Move around in the class for facilitating pupils where necessary;
- Invite some groups to present their findings and then help them to harmonize by explaining how to find the multiplication table of 7 and the meaning of multiples of 7.
- Assign the same groups to do **activity 1.12.2** and move around to each group to verify their performance;
- Ask some groups to present answers and then guide the class to harmonize by explaining how to multiply by 7.

d) Synthesis/summarization

- Guide pupils to find multiples of 7.

e) Assessment

- Provide application activities to be done by pupils and check their answers; (Application activity 1.12).

f) Answer for activities

Activity 1.12.1 & 2

Answers may vary; verify the answer provided by each pupil.

Application activity 1.12

1) a) $7 = 1 \times 7$ d) $28 = 4 \times 7$ g) $49 = 7 \times 7$ j) $70 = 10 \times 7$

b) $14 = 2 \times 7$ e) $35 = 5 \times 7$ h) $56 = 8 \times 7$

c) $21 = 3 \times 7$ f) $42 = 6 \times 7$ i) $63 = 9 \times 7$

2) a) 7 times 1 = $1 \times 7 = 7$

7 times 2 = $7 \times 2 = 14$

b) 7 times 3 = $7 \times 3 = 21$

7 times 4 = $7 \times 4 = 28$

c) 7 times 5 = $7 \times 5 = 35$

7 times 6 = $7 \times 6 = 42$

d) 7 times 7 = $7 \times 7 = 49$

7 times 8 = $7 \times 8 = 56$

e) 7 times 9 = $7 \times 9 = 63$

7 times 10 = $7 \times 10 = 70$

3) Multiplication table

a)

$\sqrt{\quad}$	0	1	2	3	4	5	6	7	8	9	10
$\times 7$	0	7	14	21	28	35	42	49	56	63	70

b)

$\sqrt{\quad}$	0	1	2	3	4	5	6	7	8	9	10
$\times 7$	0	7	14	21	28	35	42	49	56	63	70

c. 7, 14, 21, 28, 35, 42, 49, 56, 63, 70.

The lesson 19 related to: Multiples of 8 not exceeding 80 (activity 1.13.1 & Activity 1.13.2), and the lesson 20 on Multiples of 9 not exceeding 90 (activity 1.14.1 & activity 1.14.2) are taught in the same way as this previous lesson.

Lesson 21: Multiplication of a number by a single digit number

a) Objectives

Multiply a number by a single digit number (7, 8 or 9) where the product does not exceed 2000

b) Teaching resources and learning resources

- The table of place values;
- Different types of counters.
- Multiplication table for slow learners.

c) Teaching and learning activities:

- Invite pupils to observe the worked example on the multiplication of 23 by 7. Ask some guiding questions that help pupils to understand the process of how they can do it.

Thousands	Hundreds	Tens	Ones
	2	4	
	2	3	7
		×	7
1	6	5	9

- Provide explanations where necessary:

Ones: $7 \times 7 = 49$, we write 9 under ones and we keep 4 to the next place value.

Tens: $7 \times 3 = 21$, we get $21 + 4 = 25$ and we write 5 under tens and keep 2 to the next place value.

Hundreds: $7 \times 2 = 14$, we get $14 + 2 = 16$ and we write 6 under hundreds and write 1 under the place of thousands.

- Then, form groups of pupils and assign them to do the **activity 1.15.1** where they have to: draw a table of place values, complete numbers in the table, refer to the example and multiply by 7, 8 or 9 to get the product.
- Move around in the class for facilitating pupils where necessary; ask probing questions guiding them to know that they multiply starting by the right, to remember to carry a number where necessary.
- Invite some groups to present their findings and then help them to harmonize by explaining how to multiply a 3 digit number by a single digit. Guide them to discover that this method is the same as *multiplying vertically or the standard written method*.
- Assign the same groups to do **Activity 1.15.2** and move around to each group to verify their performance;
- Ask some groups to present answers and then guide the class to harmonize by explaining how to do it.

d) Synthesis/summarization

- Guide pupils to summarize how to multiply a 3 digit number by a single digit. Insist on the use of the standards written method which looks like the use of the table of values.

e) Assessment

- Provide application activities to be done by pupils (**Application activity 1.15**) and check their answers;
- Assign homework to all pupils.

f) Answer for activities

Activity 1.15.1

- a) 1 225 b) 1 512 c) 1 773 d) 1 302 e) 1 336

Activity 1.15.2

- a) $(200 \times 7) + (50 \times 7) + (4 \times 7) = 1778$
 b) $(200 \times 8) + (40 \times 8) + (5 \times 8) = 1960$
 c) $(200 \times 9) + (10 \times 9) + (9 \times 9) = 1971$
 d) $(100 \times 7) + (90 \times 7) + (8 \times 7) = 1386$
 e) $(100 \times 8) + (70 \times 8) + (9 \times 8) = 1432$
 f) $(200 \times 9) + (0 \times 9) + (9 \times 9) = 1881$

Application activity 1.15

1. a) 1 370 b) 1 836 c) 1 408 d) 1 791 e) 774
 2. they get altogether 240×8 pencils = 1840 pencils

Lesson 22: Remediation

Organize a lesson in which you *provide learning support to learners who are falling behind their peers.*

Lesson 23: Multiplication of a 3-digit number by a 2-digit number

a) Objectives

Multiply a 3 digit number by a 2 digit number where the product does not exceed 2000

b) Teaching resources and learning resources

- The table of place values;
- Different types of counters.
- Multiplication table for slow learners.

c) Teaching and learning activities:

- Invite pupils to observe the worked example on the multiplication of 23 by 7. Ask some guiding questions that help pupils to understand the process of how they can do it:

Thousands	Hundreds	Tens	Ones
	1	2	3
	×	1	2
+ 1	2	4	6
1	4	7	6

Steps:

I multiply by 2

I multiply by 1

To get the answer, I add the 2 products

- Form groups of pupils and assign them to do the **activity 1.16.1** where they have to: draw a table of place values, complete numbers in the table, refer to the example and multiply by a two digit number to get the product.
- Move around in the class for facilitating pupils where necessary; ask probing questions guiding them to know that they multiply starting by the right **multiplying by the ones**, to remember to carry a number where necessary, to jump one digit when **multiplying by the tens**, to **add to find the answer**.
- Invite some groups to present their findings and then help them to harmonize by explaining how to multiply a 3 digit number by a two digit number. Guide them to discover that this method is the same as *multiplying vertically or the standard written method*.
- Assign the same groups to do **Activity 1.16.2** and move around to each group to verify their performance;
- Ask some groups to present answers and then guide the class to harmonize by explaining how to do it.

d) Synthesis/summarization

- Guide pupils to summarize how to multiply a 3 digit number by a two digit number. Insist on the use of the standards written method which looks like the use of the table of values.

e) Assessment

- Provide application activities to be done by pupils (**Application activity 1.16**) and check their answers;
- Assign homework to all pupils.

f) Answer for activities

Activity 1.16.1

- a) 1 887 b) 1 995 c) 1 872 d) 1 969 e) 1 935

Activity 1.16.2

- $114 \times 14 = 1\,596$
- $115 \times 13 = 1\,495$
- $109 \times 12 = 1\,308$
- $103 \times 11 = 1\,133$
- $102 \times 15 = 1\,530$
- $117 \times 16 = 1\,872$
- $112 \times 17 = 1\,904$

Application activity 1.16

- a) $116 \times 16 = 1\,856$
- c) $113 \times 17 = 1\,921$
- b) $116 \times 15 = 1\,740$
- d) $110 \times 16 = 1\,760$

Lesson 24: Word problems involving multiplication of a 3-digit number by a 2-digit number**a) Objectives**

Solve word problems involving multiplication of a 3-digit number by a 2-digit number

b) Teaching resources and learning resources

- The table of place values;
- Different types of counters.
- Multiplication table for slow learners.

c) Teaching and learning activities:

Concerning the lesson on word problems involving multiplication, the teacher will help pupils to solve a one –step or a two-step problem: guide them to *understand the problem, identify facts (given and requested), draw visual representations and solve the problem using the multiplication.*

- Start by guiding pupils to solve some problems in groups or in a class discussion (**use activity 1.17.1**), provide problems to be solved into groups or in pairs (**use activity 1.17.2**) and then give problems to be solved individually (**Application activity 1.17**).

d) Answer for activities**Activity 1.17**

- 1) The number of the harvested bananas: $117 \times 17 = 1\,989$
- 2) The number of all patients hospitalized: $105 \times 19 = 1\,995$
- 3) The number of voting papers: $148 \times 13 = 1\,924$
- 4) The number of bricks to be made in 12 days = $165 \times 12 = 1\,980$

Application activity 1.17

- 1) Number of all trees they planted = $162 \times 12 = 1\,944$
- 2) Number of notebooks bought by Butera = $135 \times 14 = 1\,890$
- 3) The number of soaps to be sold in 16 days = $124 \times 16 = 1\,984$
- 4) The number of desks for the school = $18 \times 15 = 270$

Lesson 25: Multiplication by 100 or 1000

a) Objectives

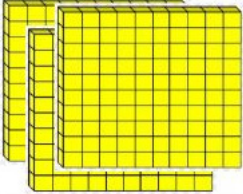
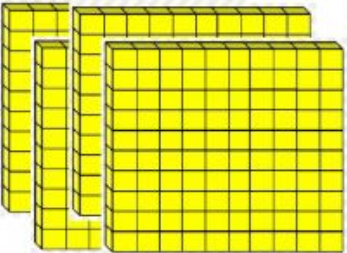
Multiply a number by 100 or 1000

b) Teaching resources and learning resources

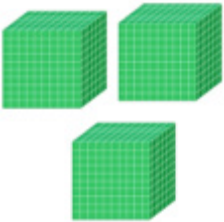
- The table of place values;
- Different types of counters.
- Multiplication table for slow learners.

c) Teaching and learning activities:

- Use base ten blocks to let pupils find that when they have for example 3 flats, the number represented is 3 times 100 which is 300 (3 with two zeros).

Hundreds	Number of flats	Total number of units	Multiplication by 100
	3	300	$4 \times 100 = 400$
	4	400	$4 \times 100 = 400$

- Use base ten blocks to let pupils find that when they have for example 3 cubes, the number represented is 3 times 1000 which is 3000 (3 with three zeros).

Thousands	Number of cubes	Total number of units	Multiplication by 1000
	3	3000	$3 \times 1000 = 3000$

– Then form pairs and assign them a questions to be answered. Refer to activity 1.18.1-3, and the application activity 1.18 to teach a lesson showing learners how to multiply by 100 and 1000.

d) Answer for activities

Activity 1.18.3

- a) 1 200 c) 1 000 e) 1 900
 b) 1 700 d) 1 960 f) 2 000

Application activity 1.16

- a) 100 b) 100 c)10 d)100 e)1000 f)100 g) 1000 h) 1000

Lesson 26: Division without a remainder of a 4-digit number less than 2000 by a one digit number

a) Objectives

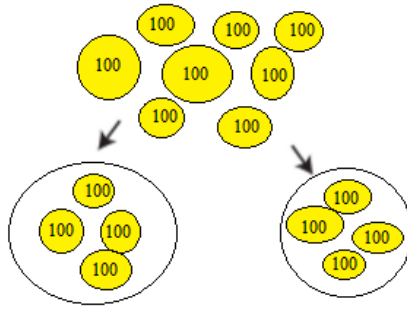
Divide a 4-digit number less than 2000 by a one-digit number without a remainder

b) Teaching resources and learning resources

- The table of place values;
- Different types of counters.
- Multiplication table for slow learners.

c) Teaching and learning activities:

– Invite pupils to discuss a situation and how they can get the answer. For example, There are 8 sacks. Each sack contains 100 counters. If there are shared equally in 2 groups, how many counters are in each group?



$$\begin{array}{r}
 400 \\
 2 \overline{) 800} \\
 \underline{-8} \\
 00 \\
 \underline{-0} \\
 00 \\
 \underline{-0} \\
 0
 \end{array}$$

- Use a drawing to illustrate the situation and ask pupils to suggest how they can get the answer.
- As pupils give the answer, show them how they can use the long division to get : $800 \div 2 = 400$.
- Form groups of pupils and assign them to do the **activity 1.19.1** and **1.19.2** where they have to: complete the division table, refer to the example and divide a 4 digit number by a one digit number.
- Move around in the class for facilitating pupils where necessary; ask probing questions guiding them to know that they divide starting by the left side and that they can take 2 digit when necessary.
- Invite some groups to present their findings and then help them to harmonize by explaining how to divide. Guide them to discover when they consider 2 digits of a dividend and that this method is the same as called *vertical division* or *the standard written method*.
- Assign the same groups to do **Activity 1.19.3** and move around to each group to verify their performance;
- Ask some groups to present answers and then guide the class to harmonize by explaining how to do it.

d) Synthesis/summarization

- Guide pupils to summarize how to divide. Insist on the use of the standards written method.

e) Assessment

- Provide application activities to be done by pupils (the application activity 1.19) and check their answers;
- Assign homework to all pupils.

f) Answer for activities

Activity 1.19.1

It is very simple, guide learners to be able to refer to the multiplication table when performing the division.

Activity 1.19.3

a) 309 b) 315 c) 206 d) 221 e) 884 f) 221

Application activity 1.19

$$\begin{array}{l} 1\ 449 \div 7 = 207 \\ 1\ 872 \div 9 = 208 \\ 1\ 704 \div 8 = 213 \\ 1\ 540 \div 5 = 308 \\ 1\ 896 \div 6 = 316 \\ 1\ 648 \div 4 = 412 \\ 1\ 686 \div 3 = 562 \end{array}$$

Lesson 27: Word problems involving the division without a remainder

a) Objectives

Solve word problems involving the division without a remainder

b) Teaching resources and learning resources

- The table of place values;
- Different types of counters.
- Multiplication table for slow learners.

c) Teaching and learning activities:

- Concerning **the lesson on word problems involving division without remainder**, the teacher will help pupils to solve a one –step or a two-step problem:
- Guide them to *understand the problem, identify facts (given and requested), draw visual representations related to equal shares and solve the problem using the division.*

- Start by guiding pupils to solve some problems in a class discussion, provide problems to be solved into groups or in pairs and then give problems to be solved individually. Refer to **Activity 1.20** and **Application activity 1.20**.

d) Answer for activities

Activity 1.20

- 1) Number of students for each classroom = $378 \div 9 = 42$
- 2) Number of books each school can receive = $894 \div 6 = 149$
- 3) Number of mosquito nets each cell can receive = $1\ 985 \div 5 = 397$
- 4) Number of sacks of irish potatoes to be carried by each lorry = $1\ 359 \div 9 = 151$

Application activity 1.20

- 1) Number of eggs to be put in each box = $1\ 768 : 8 = 221$
- 2) Number of playing balls to be received by each district = $1\ 484 : 7 = 212$
- 3) The number of bricks made by Mubumbyi everyday = $1\ 888 : 8 = 236$
- 4) Number of textbooks each school can receive = $1\ 845 : 5 = 369$

1.6 Summary of the unit

Try to summarize the content for this unit.

1.7 Additional information for the teacher

- The teacher plays an important role in the learning activity, guide all learning situations and engage every pupil;
- Explain clearly how to read write numbers and how to write them in figures and in words, how to compare numbers, how to arrange them and how to partition a number into thousand, hundreds, tens and ones.
- Guide them to be able to perform addition subtraction, multiplication and division of numbers;
- Use learning materials to illustrate the concepts,
- Address crosscutting issues during lessons where applicable;
- Try to use your creativity and innovation to apply the competence based approaches of teaching to cater all learning styles for your pupils.

1.8 Answers for the end unit assessment

- 1) a) One thousand, nine hundred eighty seven b) 1 378
- 2) 1 789
- 3) a) 1 798 b) 1 739

- 4) a) ones b) Tens c) Hundreds d) Ones
- 5) a) $1\ 095 > 1\ 059$ b) $1\ 741 < 1\ 876$
- 6) 1 789, 1 798, 1 879, 1 897, 1 978, 1 987.
- 7) 1 970, 1 907, 1 790, 1 709, 1 097, 1 079.
- 8) 1 997 b) 1 904
- 9) a) 1 023 b) 362
- 10) a) 1 248 b) 1 435 c) 1 881 e) 1 911 d) 1 860
- 11) a) 222 b) 121 c) 209
- 12) The number of all citizens in Bibare cell: $367 + 445 + 461 + 723 = 1\ 996$.
- 13) The number of boys = $1\ 874 - 987 = 887$.
- 14) The number of all trainees = $275 \times 7 = 1\ 925$
- 15) The number of mosquito nets each village can receive = $1\ 998 : 6 = 333$

1.9 Additional activities

a) Remedial activities

- 1) Write in figures or in words
- a) One thousand, five hundred
- b) 1 820:
- 2) Find the expanded number
- a) $1\ 000 + 200 + 50 =$ b) $(1\ 000 \times 1) + (100 \times 3) + (10 \times 2) + (1 \times 2) =$
- 3) Use comparison symbol ($<$, $>$ or $=$) to compare numbers
- a) 450 ... 1 000 b) 850 ... 850 c) 1 240 ... 1 500
- 4) Arrange numbers in an ascending order
- 1 100, 700, 1 000, 1 300.
- 5) Arrange numbers in a descending order
- 1 200, 900, 1 500, 1 400.
- 6) Work out:
- a) $724 + 273 =$ b) $1\ 453 - 212 =$ c) $234 \times 2 =$ d) $1\ 863 : 3 =$
- 7) Solve these word problems
- a) We are 45 pupils in our classroom. If the school registers other 12 new pupils, how many pupils can our classroom have?

- b) MUHIRE harvested 378 cabbages. If 178 cabbages from them were sold to clients, how many cabbages remained?
- c) Our school has 11 classrooms. If on classroom has 32 pupils, how many pupils does our school have?
- d) Share equally 484 mangoes among 4 people. How many mangoes can each person get?

Answers

- 1) a) 1 500 b) One thousand, eight hundred twenty.
 2) a) 1 250 b) 1 322
 3) a) $450 < 1\ 000$ b) $850 = 850$ c) $1\ 240 < 1\ 500$
 4) 700, 1 000, 1 100, 1 300.
 5) 1 500, 1 400, 1 200, 900.
 6) a) 997 b) 1 665 c) 468 d) 621.
 7) a) Our classroom is going to have : $45+12= 57$
 b) Number of cabbages remained: $378 -178 = 200$
 c) Number of pupils for our school: $11 \times 32 = 352$
 d) Number of mangoes each person can get: $484 : 4 = 121$.

b) Extension activities

- 1) Write in figures or in words
 a) 1 979 :
 b) One thousand, six hundred ninety seven
- 2) Find the number that was decomposed:
 a) 8Hundreds 7Tens 1thousands 9 ones =
 b) 4 Tens 3Hundreds 9ones 1thousands =
 c) b 9 ones 1Thousands 6Tens 5Hundreds =
- 3) Use $<$, $>$ or $=$ to compare numbers as follow:
 a) 1 7751 946 c) 1 393 1 953
 b) 1 798..... 1726 d) 1 562 1 948
- 4) Arrange these numbers in an ascending order:
 1798, 1879, 1978, 1789, 1897, 1987
- 5) Arrange these numbers in a descending order:
 1564, 1654,1456,1546,1645, 1465
- 6) Work out:
 a) $978 + 896 =$ b) $1\ 901 - 987 =$ c) $274 \times 7 =$ d) $1\ 795 : 5 =$

7) Solve these word problems

- a) In our village we have 798 children, 157 men, 598 youth and 239 women. Determine the total number of the population for our village.
- b) Ineza had 2 000 eggs; she sold 298 eggs from them and other 379 were broken. How many eggs remained?
- c) In a certain prison there are 75 rooms. If 26 prisoners live in each room, how many prisoners are there?
- d) Share 1872 iron sheets equally among 9 villages. How many iron sheets does each village get?

Answers:

1) a) one thousand nine hundred seventy nine b) 1 697

2) a) 1 879 b) 1 349 c) 1 569

3) a) 1 775 > 1 946 c) 1 393 < 1 953

b) 1 798 > 1726 d) 1 562 > 1 948

4) 1 789, 1 798, 1 879, 1 897, 1 978, 1 987

5) 1 654, 1 645, 1 564, 1 546, 1 465, 1 456

6) a) 1 874 b) 914 c) 1 918 d) 395

7) Word problems

a) The total number of the population for our village:

$$798 + 157 + 598 + 239 = 1\,792$$

b) Ineza remained with: $2\,000 - (1\,298 + 379) = 323$ eggs

c) Number of prisoners: $75 \times 26 = 1\,950$

d) Number of iron sheets for one village: $1\,872 \div 9 = 208$.

UNIT 2

NUMBERS UP TO 5000

2.1 Key unit competence:

Count, read, write, expand, decompose, order, compare, add, subtract, multiply, divide numbers less than or equal to 5000.

2.2 Prerequisite

Pupils will easily learn this unit, if they have a good background on the following: to count, read, write, order, compare, add, subtract, multiply and divide numbers from 0 to 2 000.

2.3 Cross-cutting issues to be addressed

- **Gender balance:** provide equal opportunity to boys and girls in the lesson
- **Inclusive education:** promote education for all learners in the teaching and learning activities.
- **Environment and sustainability:** This will be addressed when pupils will be maintaining hygiene for their classroom and for materials they used.
- **Financial education:** addressed when pupils discuss word problem involving how to use money and how to manage learning materials or how to prepare activity plan.
- **Peace and values education:** addressed when pupils are encouraged to work collaboratively and peacefully in their group.

2.4 Sub-headings /List of lesson

UNIT 2: NUMBERS FROM 0 UP TO 5000 (40 periods)			Reinforcement and Extension	
	Lesson title	Learning objectives	Number of periods	
1	Introductory activity	Arouse the curiosity of learners on the importance of counting, reading and writing numbers.	1	
2	Reading numbers up to 5000 in figures	Read the number written in figures up to 5000.	1	
3	Writing numbers in figures up to 5 000 in figures	Write in figures the numbers up to 5000.	1	

4	Place values and expanded form of numbers	Expand a number between 0 and 5 000 into ones, tens, hundreds and thousands.	1	1
5	Writing numbers up to 5000 in words	Write numbers up to 5 000 in words	1	1
6	Remediation	<i>Provide learning support to learners who are falling behind their peers</i>	1	
7	Comparing numbers less than or equal to 5 000	Compare numbers less than or equal to 5000.	2	1
8	Arranging numbers less than or equal to 5 000 in ascending order	Arrange numbers less than or equal to 5000 in ascending order.	1	
9	Arranging numbers less than or equal to 5 000 in descending order	Arrange numbers less than or equal to 5 000 in descending order.	1	
10	Addition of numbers whose sum does not exceed 5 000 without carrying	Add numbers whose sum does not exceed 5000 without carrying.	1	1
11	Remediation	<i>Provide learning support to learners who are falling behind their peers</i>	1	
12	Addition of numbers whose sum does not exceed 5 000 with carrying	Add numbers whose sum does not exceed 5000 with carrying.	1	1
13	Word problems involving addition of numbers whose sum does not exceed 5000	Solve word problems involving addition of numbers whose sum does not exceed 5000.	1	
14	Subtraction of numbers within 5000 without borrowing	Subtract numbers within 5000 without borrowing.	1	
15	Subtraction of numbers within 5 000 with borrowing	Subtract numbers within 5000 with borrowing.	1	1
16	Word problems involving subtraction of numbers within 5000	Solve word problems involving subtraction of numbers within 5000.	1	

17	Remediation	<i>Provide learning support to learners who are falling behind their peers</i>	1	
18	Multiplication of a 3 digit number by a 2 digit number where the product does not exceed 5 000	Multiply a 3 digit number by a 2 digit number where the product does not exceed 5000.	2	1
19	Multiply numbers by 100 and 1 000 where the product does not exceed 5000	Multiply numbers by 100 and 1 000 where the product does not exceed 5000.	1	
20	Word problems involving multiplication of a 3 digit number by a 2 digit number where the product does not exceed 5 000	Solve word problems involving multiplication of a 3 digit number by a 2 digit number where the product does not exceed 5000.	2	1
21	Remediation	<i>Provide learning support to learners who are falling behind their peers</i>	1	
22	Division without a remainder of a 4 digit number less than 5 000 by a one digit number	Divide a 4-digit number less than 5000 by a one-digit number without a remainder.	2	1
23	Word problems involving the division of a number less than 5 000 by a one-digit number.	Solve word problems involving the division of a number less than 5 000 by a one-digit number.	2	1
24	End unit assessment	Count, read, write, expand, decompose, order, compare, add, subtract, multiply, divide numbers less than or equal to 5000.	1	
25	Remediation	<i>Provide learning support to learners who are falling behind their peers</i>	1	
	Total		30	10

2.5 Guidance on different lessons

Lesson 1: Introductory activity 2

- Invite pupils to read the story of Rugero who does not know how to manage the quantity of eggs laid by his chickens.
- Guide pupils to discuss the reason one can fail to count the number of objects;
- Ask them to suggest what is required for every one of them to be able to count the quantity of many objects;
- Move around in the classroom to get aware of different suggestions and ask some probing questions where necessary.
- Invite all pupils to a class discussion and basing on their experience, prior knowledge and abilities shown in answering questions for this activity, open a discussion with probing questions to guide them to give their predictions and ensure that you arouse their curiosity on what is going to be learnt in this unit so that they may be able to manage different quantities of their properties.

Lesson 2: Reading numbers up to 5 000

a) Objectives

Read the number written in figures up to 5000

b) Teaching resources and learning resources

- The table of place values;
- Number cards with different numbers between 2 000 and 5 000 in different colors;
- Different types of counters.

c) Teaching and learning activities:

This lesson is taught like the lesson 2 seen in unit 1. However, it can be taught by reading and then writing numbers in figures.

d) Synthesis/summarization

Guide pupils to read aloud the numbers up to 5 000 written in figure.

e) Assessment

Provide application activities to pupils from the pupil's book asking them to write numbers in a table of place values, read loudly and write them in words.

f) Answer for activities

Activity 2.1.1

1) Guide pupils to read numbers correctly.

2) Pupils will read these numbers:

1 000; 1 500; 2 000; 2 500; 3 000; 3 500; 4 000; 4 500, 5 000.

b) 1 000; 1 500; 2 000; 2 500; 3 000; 3 500; 4 000; 4 500, 5 000.

c) 500.

Activity 2.1.2

Pupils can form different numbers the following are examples

a) 2 345 ; 2 418 ; 2 165;....; 2 498

d) 3580; 3 897; 3 765;...;3 987.

b) 2 567; 2 689; 2 967; ...;2 987

e) 4 376 ; 4 350; 4 598, ...; 4 987.

c) 3 125 ; 3 459 ; ...;3 498

f) 4 789, 4 632 ; 4 895;; 4 987.

Remind pupils to use a digit once.

Application activity 2.1

- 1 251: One thousand, two hundred and fifty one;
- 2 437: Two thousand, four hundred and thirty seven
- 3 317: Three thousand, three hundred and seventeen.

Note: See in the previous unit the rule to follow when writing number in words:

Lesson 3: Writing numbers up to 5000 in figures.

a) Objectives

Write numbers up to 5 000 in figures.

b) Teaching resources and learning resources

- Number cards with different digits
- Number cards made by different numbers up to 5000 in different colors;
- Different types of counters.

c) Teaching and learning activities:

This lesson can be taught like the lesson 3 seen in unit 1.

d) Synthesis/summarization

Guide pupils to write in figures the numbers up to 5 000.

e) Assessment

Guide pupils to write correctly the missing numbers and to form numbers using number cards (see Application activity 2.2).

- Guide learners to read their formed numbers.

f) Answer for activities

Activity 2.2.1

Pupils can make different numbers. For example,

2345: Two thousand, three hundred forty five.

2354: Two thousand, three hundred fifty four.

Activity 2.2.2

1) a) 2100; 2 300; 2 500 ; 2 700; 2 900

b) 3 100; 3 300; 3 500; 3 700; 3 900

c) 4 100; 4 300; 4 500; 4 700; 4 900

2) Pupils will read and write the required numbers in figure

a) 2 016; 2 017; 2 018; 2 019.

b) 2 071; 2 072; 2 073; 2 074.

c) 4 066; 4 067; 4 068; 4 069.

Application activity 2 .2

Answers may vary; for example:

1 234; 2 134; 4 123; 3 421; 4 231; 2 341.

Lesson 4: Place values and expanded form of numbers up to 5 000

a) Objectives

Expand a number between 0 and 5 000 into ones, tens, hundreds and thousands

b) Teaching resources and learning resources

- Abacus
- The table of place values;
- Number cards with different numbers between 1000 and 5 000 in different colors;
- Different types of counters.

c) Teaching and learning activities:

This lesson is taught like the lesson 4 and lesson 5 related to place value and expanded form of numbers up to 2000. You will refer to **activity 2.3.1, activity 2.3.2, activity 2.3.3, activity 2.4.1, activity 2.4.2 and Activity 2.4.3.**

d) Synthesis/summarization

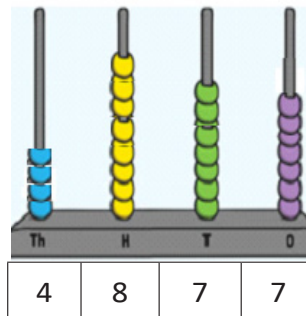
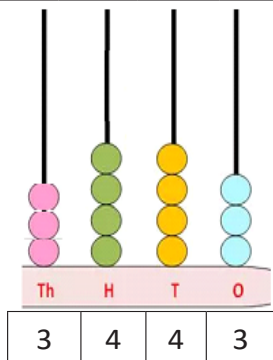
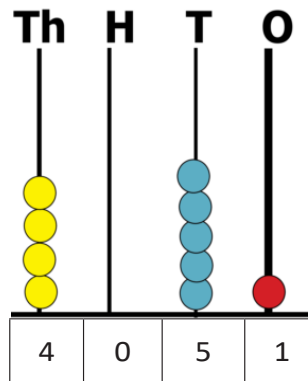
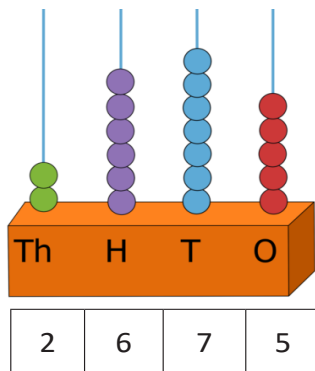
Guide pupils to summarize how to draw a table of place value, how to complete a number in such a table and how to partition that number into thousands (Th), hundreds (H), tens (T) and ones (O).

e) Assessment

- Provide application activities to be done by pupils (see **application activity 2.3**) and check their answers;
- Assign all pupils to do the **Application 2.4** as homework.

f) Answer for activities

Activity 2.3.1



Activity 2.3.2

Thousands	Hundreds	Tens	Ones
3	5	4	6
2	9	3	2
4	9	6	9
2	7	9	4
4	9	3	5

Activity 2.3.3

- a) 2564 = 2 Thousands 5 Hundreds 6 Tens 4 Ones.
- b) 3968 = 6 Tens 3 Thousands 8 Ones 3 Hundreds.
- c) 4975 = 9 Hundreds 5 Ones 4 Thousands 5 Tens.
- d) 2936 = 6 Ones 9 Hundreds 3 Tens 2 Thousands.
- e) 3917 = 1 Ten 9 Hundreds 3 Thousands 7 Ones.
- f) 4795 = 7 Hundreds 5 Ones 4 Thousands 9 Tens.

Application activity 2.3

- 1) a) 4 ones c) 4 Tens e) 1 Tens
- b) 4 thousands 5 tens d) 9 hundreds f) 3 thousands 9 ones

Activity 2.4.3

- 1) a) $4\ 652 = (4 \times 1\ 000) + (6 \times 100) + (5 \times 10) + (2 \times 1)$
- b) $2\ 879 = (2 \times 1\ 000) + (8 \times 100) + (7 \times 10) + (9 \times 1)$
- c) $3\ 574 = (3 \times 1\ 000) + (5 \times 100) + (7 \times 10) + (4 \times 1)$
- d) $2\ 634 = (2 \times 1\ 000) + (6 \times 100) + (3 \times 10) + (4 \times 1)$
- e) $4\ 971 = (4 \times 1\ 000) + (9 \times 100) + (7 \times 10) + (1 \times 1)$
- f) $3\ 695 = (3 \times 1\ 000) + (6 \times 100) + (9 \times 10) + (5 \times 1)$
- g) $3\ 916 = (3 \times 1\ 000) + (9 \times 100) + (1 \times 10) + (6 \times 1)$
- h) $2\ 397 = (2 \times 1\ 000) + (3 \times 100) + (9 \times 10) + (7 \times 1)$
- i) $4\ 645 = (4 \times 1\ 000) + (6 \times 100) + (4 \times 10) + (5 \times 1)$
- 2) a) 4 975 b) 3 647 c) 2 796 d) 3 528 e) 4 879 f) 2 677

Application activity 2.4

- 1) a) 4 657 = 4 thousands, 6 hundreds, 5 tens, 7 ones
- b) 2 726 = 2 thousands, 7 hundreds, 2 tens, 6 ones
- c) 3 965 = 3 thousands, 9 hundreds, 6 tens, 5 ones
- d) 4 425 = 4 thousands, 4 hundreds, 2 tens, 5 ones
- e) 2 645 = 2 thousands, 6 hundreds, 4 tens, 5 ones
- f) 3 371 = 3 thousands, 3 hundreds, 7 tens, 1 one.
- 2) a) 2 694 b) 4 549 c) 3 475

Lesson 5: Writing numbers up to 5 000 in words

a) Objectives

Write numbers up to 5 000 in words.

b) Teaching resources and learning resources

- Abacus or table of place values
- Number cards made by different numbers between 2 000 and 5 000 in different colors.

c) Teaching and learning activities:

This lesson is taught like the lesson on writing numbers seen in unit 1. But numbers to be written are between 2000 and 5 000 and you will refer to **the activity 2.5**.

- Pupils decompose the number:

Example: The number 3246 = 3 thousands 2 hundreds 4 tens 6 ones.

- They show how it is expanded,

$$3246 = 3000 + 200 + 40 + 6.$$

- They read how it is expanded and then, they write in words what they read
 $3246 = 3000 + 200 + 40 + 6 =$ Three thousand two hundred and forty-six.

d) Synthesis/ summarization

Guide pupils to write numbers in words using a table of place values: Insist on the fact of removing “s” on each period and insert “and” after the first digit in every group of 3 numbers (hundreds) that contain tens or units.

e) Assessment

- Provide application activities to be done by pupils (use the **Application activity 2.5**) and check their answers;
- Assign all pupils to do the **Application activity 2.5** as homework.

f) Answer for activities

Activity 2.5

$$\begin{array}{r} 1) \text{ a) } 2579 = \quad 2000 \quad \text{Two } \mathbf{thousands} \\ \quad \quad \quad + \quad 500 \quad \text{Five } \mathbf{hundreds} \\ \quad \quad \quad + \quad 70 \quad \text{Seventy} \\ \quad \quad \quad + \quad 9 \quad \text{Nine} \end{array}$$

b) 4853 in words is: four thousand, eight hundred and fifty three.

2) Complete the table

Number	Expanded form	Number in words
2 528	$2\ 000 + 500 + 20 + 8$	Two thousand, five hundred and twenty eight
4 <u>291</u>	$4\ 000 + 200 + 90 + 1$	Four thousand, two hundred and ninety one
4 999	$4\ 000 + 900 + 90 + 9$	Four thousand, nine hundred and ninety nine

Application activity 2.5

- 1) a) 2 139: Two thousand, one hundred and thirty-nine
b) 3 745: Three thousand, seven hundred and forty-five
c) 3 416: Three thousand, four hundred and sixteen
d) 4 997: Four thousand, nine hundred and ninety-seven.
- 2) a) Three thousand, seven hundred and forty-four: 3 744
b) Four thousand nine hundred and thirty-five: 4 935
c) Two thousand and twelve: 2 012
d) Four thousand, eight hundred and eighty eight: 4 888

Lesson 6: Remediation

Organize a lesson in which you *provide learning support to learners who are falling behind their peers.*

Lesson 7: Comparing numbers less than or equal to 5 000

a) Objectives

Compare numbers less than or equal to 5000

b) Teaching resources and learning resources

- The table of place values;
- Number cards with different numbers between 2 000 and 5 000 in different colors;
- Different types of counters.

c) Teaching and learning activities:

This lesson is taught like the lesson 7 seen in unit 1. But numbers to be compared are between 2000 and 5 000 and you will refer to the **activity 2.6.1** and **activity 2.6.2**.

d) Synthesis/summarization

Guide pupils to summarize how to compare numbers using a table of place values: Insist on the comparison of thousands (Th), hundreds (H), tens (T) and ones (O).

e) Assessment

- Provide application activities to be done by pupils (use the **application activity 2.6**) and check their answers;
- Assign all pupils a homework.

f) Answer for activities

Activity 2.6.1

a) 3756 is **greater than** 3287

b) 3287 is **less than** 3756

Activity 2.6.2

a) $4\ 958 = 4\ 958$

d) $4\ 253 > 2\ 352$

b) $3\ 174 > 2\ 797$

e) $3\ 764 < 4\ 674$

c) $2\ 962 < 3\ 637$

f) $2\ 315 < 4\ 135$

Application activity 2.6

1.

Men	Women	Youth	Children
1 823	1 987	3 298	4 567

a) The number of women is greater than the number of men ($1\ 987 > 1\ 823$).

b) The number of men is less than the number of youth ($1\ 823 < 3\ 298$).

c) The number of children is greater than the number of men ($4\ 567 > 1\ 823$).

d) The number of men is less than the number of children ($1\ 823 < 4\ 567$).

2. a) Ubumwe b) Umutuzo c) Amahoro d) Amahoro

e) - The number of men for Umutuzo is less than the number of men for Amahoro ($2\ 347 < 4\ 230$)

- The number of men for Ubumwe is less than the number of men for Umubano ($1\ 214 < 3\ 045$)

- The number of women for Amahoro is greater than the number of women for Umubano ($4\ 031 > 3\ 005$)

- The number of women for Ubumwe is greater than the number of women for Umutuzo ($1\ 328 > 2\ 114$).

Lesson 8-9: Arrange numbers between 2000 and 5000 in ascending or descending order

This lesson can be taught in **two different lessons**: arranging numbers in ascending order and the second related to arranging numbers in descending order.

a) Objectives

Arrange numbers less than or equal to 5000 in ascending or descending order.

b) Teaching resources and learning resources

- The table of place values;
- Number cards with different numbers between 2 000 and 5 000 in different colors;
- Different types of counters.

c) Teaching and learning activities:

This lesson for arranging numbers between 2 000 and 5 000 in ascending or descending order is taught in the same way as the lesson of arranging numbers between 0 and 1 000 learnt in the unit 1. Use the **activity 2.7.1**, **activity 2.7.2**, **activity 2.7.3** and **activity 2.7.4**

d) Synthesis/summarization

- Guide pupils to summarize how to arrange numbers in an ascending order and in a descending order. Insist on the use of table of values to guide the comparison and then the arrangement of numbers.

e) Assessment

- Provide application activities to be done by pupils (application activity 2.7) and check their answers;
- Assign homework to all pupils.

f) Answer for activities

Activity 2.7.1

- 1) 2 348, 3 248, 4 832 3) 3 438, 4 334, 4 833
2) 2 743, 3 247, 4 237 4) 2 437, 3 472, 4 327

From picture:

- 1) 2 345, 2 435, 3 245, 3 425, 4 245. 3) 2 934, 3 429, 3 942, 4 293, 4 329.
2) 2 349, 2 534, 3 542, 4 425, 4 524. 4) 2 483, 2 493, 3 249, 4 328, 4 939.

Activity 2.7. 2

- 1 937, 2 456, 3 271, 4 010, 4 101.

Activity 2.7. 3

- a) 4 321, 4 231, 3 412, 3 214, 2 431, 2312.
b) 4533, 4 123, 3 345, 3 124, 2 341, 2 143

Activity 2.7. 4

- 1) 4 352, 3 254 , 2 543. 3) 4 932, 4 392, 3 942, 2 439.
2) 4 235, 3 453, 2 435. 4) 4 293, 3 492, 3 294, 2 394.

Application activity 2.7

- 1) a) 4 397, 4 739, 4 973
b) 3 479, 3 749, 4 97
c) 4 018, 4 108, 4 128, 4 182
d) 4 071, 4 107, 4 170, 4 701.
- 2) a) 4 362, 3 263, 2 643
b) 4 763, 4 367, 3 647
c) 2 974, 2 947, 2 479
d) 3 832, 3 823, 3 283, 3 238.

Lesson 10-12: Addition of numbers whose sum does not exceed 5 000

a) Objectives

Add numbers and solve word problems involving addition of numbers whose sum does not exceed 5000.

b) Teaching resources and learning resources

- The table of place values;
- Number cards with different numbers between 2 000 and 5 000 in different colors;
- Different types of counters.

c) Teaching and learning activities:

This lesson can be taught like the lesson on addition learnt in unit 1. However, the teacher can teach it in **3 different lessons**: start by teaching addition without carrying, addition with carrying and then word problem involving addition. The guiding learning activities are **activity 2.8.1, activity 2.8.2, activity 2.8.3, activity 2.8.4 and the activity 2.9.**

d) Synthesis/summarization

- Guide pupils to summarize how to add numbers without or with carrying. Insist on the use of the standard written method which looks like the use of the table of values.

e) Assessment

- Assign pupils to work in pair, work out **Application activity 2.8.1 and 2.8.2** and verify their answers
- Provide application activities to be done by pupils (**application activity 2.9**) and check their answers;
- Assign homework to all pupils.

f) Answer for activities

Activity 2.8.1

a) 3 454	b) 2 523	c) 3 435	d) 4 017	e) 2 454
<u>+1 421</u>	<u>+2 175</u>	<u>+1 543</u>	<u>+ 972</u>	<u>+2 432</u>
4 875	4 698	4 978	4 989	4 886

Activity 2.8.2

1. a) $4\,235 + 763 = 4\,998$ d) $2\,990 + 2\,009 = 4\,999$
b) $2\,567 + 1\,421 = 3\,988$ e) $3\,735 + 1\,251 = 4\,986$
c) $3\,909 + 1\,090 = 4\,999$ f) $4\,056 + 823 = 4\,879$

2.

a) 2 524	b) 3 521	c) 3 274	d) 4 215
<u>+2 471</u>	<u>+1 268</u>	<u>+1 625</u>	<u>+581</u>
4 995	4 789	4 899	4 796
e) 2 425	f) 5 156	g) 4 123	
<u>+2 434</u>	<u>+1 632</u>	<u>+ 675</u>	
4 859	4 798	4 798	

Application activity 2.8.1

- a) $3\,543 + 1\,456 = 4\,999$ d) $4\,675 + 323 = 4\,998$
b) $2\,235 + 2\,704 = 4\,927$ e) $2\,454 + 2\,452 = 4\,906$
c) $3\,972 + 1\,017 = 4\,989$

Activity 2.8.3

a) 2 897	b) 3 093	c) 1 395	d) 1 024	e) 1 154
<u>+1 654</u>	<u>+1 379</u>	<u>+3 499</u>	<u>+3 699</u>	<u>+2 799</u>
4 551	4 472	4 894	4 723	3 953

Activity 2.8.4

1. a) $2\,943 + 1\,979 = 4\,922$ c) $1\,239 + 3\,678 = 4\,917$
b) $3\,967 + 797 = 4\,764$ d) $2\,795 + 2\,089 = 4\,884$
2. a) $1\,924 + 2\,789 = 4\,713$ b) $2\,905 + 1\,978 = 4\,883$ c) $3\,024 + 1\,879 = 4\,903$
d) $1\,952 + 2\,897 = 4\,849$ e) $2\,642 + 2\,198 = 4\,840$ f) $3\,721 + 1\,089 = 4\,810$
g) $2\,313 + 2\,679 = 4\,992$

Application activity 2.8.2

- a) $4\ 072 + 928 = 5\ 000$ c) $3\ 472 + 1\ 097 = 4569$ e) $3246 + 1475 = 4721$
b) $3\ 235 + 757 = 3\ 992$ d) $3\ 765 + 997 = 4762$

- Concerning **the lesson on word problems involving addition**, the teacher will help pupils to solve a one –step or a two-step problem: guide them to *understand the problem, identify facts (given and requested), draw visual representations and solve the problem using the addition.*
- Start by guiding pupils to solve some problems in groups or in a class discussion (use **activity 2.9**), provide problems to be solved into groups or in pairs **and then give problems to be solved individually referring to Application activity 2.9.**

Answers for Activity 2.9

- 1) The number of all iron sheets the company makes per day: $2\ 345 + 2\ 649 = 4\ 994$
- 2) The number of trees planted by our cell in two years: $1\ 897 + 3\ 098 = 4\ 995$
- 3) the total number of all students at the complex school: $3\ 785 + 1\ 215 = 5\ 000$
- 4) the number of all fans in the stadium: $2\ 178 + 2\ 789 = 4\ 967$

Answers for Application activity 2.9

- 1) The total number of people who are at the hospital: $2\ 679 + 1\ 829 + 245 + 79 = 4\ 832$
- 2) The total number of people who are in the train: $2\ 189 + 1\ 689 + 789 = 4\ 667$
- 3) Number of people in the meeting room: $3\ 978 + 978 = 4\ 956$
- 4) Number of all cabbages harvested by Butera in two years: $3\ 197 + 1\ 789 = 4\ 986$.

Lesson 13: Remediation

Organize a lesson in which you *provide learning support to learners who are falling behind their peers.*

Lesson 14-16: Subtraction of numbers within the range of 5 000

a) Objectives

Subtract numbers and solve word problems involving subtraction of numbers that do not exceed 5000.

b) Teaching resources and learning resources

- The table of place values;
- Number cards with different numbers between 2 000 and 5 000 in different colors;
- Different types of counters.

c) Teaching and learning activities:

This lesson can be taught like the lesson on subtraction learnt in unit 1. However, the teacher can teach it in **3 different lessons**: start by teaching subtraction without borrowing, subtraction with borrowing and then the lesson on word problem involving subtraction. The guiding learning activities are **activity 2.10.1, activity 2.10.2, activity 2.10.3, activity 2.10.4 and the activity 2.11** respectively.

d) Synthesis/summarization

- Guide pupils to summarize how to subtract numbers. Insist on the use of the standards written method which looks like the use of the table of values.

e) Assessment

- Assign pupils to work in pair for activity 2.10.2 or activity 2.10.4 and verify their answers.
- Provide application activities to be done by pupils (**Application activity 2.10.1** or **application activity 2.10.2**).

f) Answer for activities

Activity 2.10.2

Guide pupils to use a table of place value or a standard written method:

a) $\begin{array}{r} 4\ 956 \\ -3\ 124 \\ \hline 1\ 832 \end{array}$	b) $\begin{array}{r} 3\ 599 \\ -3\ 467 \\ \hline 132 \end{array}$	c) $\begin{array}{r} 2\ 975 \\ -1\ 453 \\ \hline 1\ 522 \end{array}$	d) $\begin{array}{r} 3\ 694 \\ -2\ 573 \\ \hline 1\ 121 \end{array}$	e) $\begin{array}{r} 4\ 799 \\ -3\ 429 \\ \hline 1\ 370 \end{array}$
--	---	--	--	--

Activity 2.10.2

- a) $4\ 795 - 2\ 563 = 2\ 232$ b) $3\ 765 - 2\ 431 = 1\ 334$ c) $2\ 897 - 1\ 794 = 1\ 103$
d) $4\ 965 - 3\ 941 = 1\ 024$ e) $2\ 765 - 1\ 312 = 1\ 453$ f) $3\ 956 - 2\ 932 = 1\ 024$
- a) $4\ 967 - 3624 = 1343$ b) $3\ 857 - 2523 = 1334$ c) $2\ 957 - 3712 = 1042$
d) $4985 - 3712 = 1273$ e) $3758 - 7715 = 1043$ f) $2896 - 1465 = 1431$
g) $4738 - 2617 = 2121$

Application activity 2.10.1

- a) $2\ 543 - 1412 = 1131$ d) $2\ 765 - 1523 = 1242$
b) $4\ 235 - 3740 = 495$ e) $3\ 599 - 3\ 429 = 170$
c) $3\ 729 - 2517 = 1\ 212$

Activity 2.10.3

a) $4\ 243$	b) $3\ 613$	c) $2\ 345$	d) $3\ 524$	e) $3\ 241$
$-\underline{2\ 798}$	$-\underline{2\ 379}$	$-\underline{1\ 769}$	$-\underline{2\ 659}$	$-\underline{3\ 974}$
1445	$1\ 234$	576	865	267

Activity 2.10.4

1. a) $4\ 571 - 3\ 796 = 775$ b) $3\ 423 - 2\ 975 = 448$ c) $4\ 234 - 3\ 596 = 638$
d) $2\ 345 - 1\ 687 = 658$ e) $4\ 567 - 2\ 789 = 1\ 778$ f) $3\ 567 - 1\ 678 = 1\ 889$
2. a) $4\ 123 - 2\ 079 = 2\ 044$ b) $3\ 105 - 1\ 987 = 1\ 118$ c) $4234 - 3978 = 256$
d) $2\ 346 - 1\ 879 = 467$ e) $4\ 241 - 3\ 786 = 455$ f) $5\ 000 - 4\ 976 = 24$
g) $4\ 000 - 3\ 298 = 702$

Application activity 2.10.2

- a) $4\ 678 - 2\ 789 = 1\ 889$ b) $2\ 785 - 1\ 896 = 2\ 111$ c) $4\ 009 - 3\ 967 = 42$
d) $3\ 234 - 2\ 567 = 667$ e) $4\ 341 - 1\ 779 = 2562$

Note:

- Concerning **the lesson on word problems involving subtraction**, the teacher will help pupils to solve a one-step or a two-step problem: guide them to *understand the problem, identify facts (given and requested), draw visual representations and solve the problem using the subtraction.*
- Start by guiding pupils to solve some problems in groups or in a class discussion (use **activity 2.11**),
- Provide problems to be solved into groups or in pairs and then
- Give problems to be solved individually from **application activity 2.11**.

Answers for Activity 2.11

- 1) The number of bricks Keza remained with: $3\ 567 - 987 = 2\ 580$.
- 2) The number of textbooks he remained with: $4\ 123 - 1\ 456 = 2\ 667$.
- 3) The number of undamaged avocados: $3\ 214 - 789 = 2\ 425$.
- 4) The number of citizens who are in other divisions of Ubudehe:
 $4\ 132 - 1\ 968 = 2\ 164$.

Answers for Application activity 2.11

- 1) The number of non modern houses in our cell: $4\ 356 - 2\ 789 = 1\ 567$.
- 2) Number of eggs that are not broken: $3\ 456 - 9\ 87 = 2\ 469$.
- 3) The number of not grown up trees: $4\ 321 - 3\ 567 = 754$.

Lesson 17: Remediation

Organize a lesson in which you *provide learning support to learners who are falling behind their peers.*

Lesson 18-20: Multiply a two-digit or three-digit number by a two digit number where the product does not exceed 5 000

a) Objectives

Multiply a 3 digit number by a 2 digit number and solve word problems involving multiplication of a 3 digit number by a 2 digit number where the product does not exceed 5000.

b) Teaching resources and learning resources

- The table of place values;
- Different types of counters.
- Multiplication table for slow learners.

c) Teaching and learning activities:

- Invite the whole class discussion and guide pupils on how to multiply:

We can use a place value table:

Thousands	Hundreds	Tens	Ones
	1 ×	9 2	8 4
+ 3	7 9	9 6	2
4	7	5	2

Steps:

I multiply 198 by 4

I multiply 198 by 2 and I write the answer starting by tens.

I add the two answers to get the product

Therefore, $198 \times 24 = 4752$

We can multiply vertically:

$$\begin{array}{r} 198 \\ \times 24 \\ \hline 792 \\ +396 \\ \hline 4752 \end{array}$$

a) I multiply 198 by 4
b) I multiply 198 by 2 and I write the answer starting by tens.
c) I add the two answers to get the product

- In each case, provide more explanations.
- Form groups of pupils and assign them to do the **activity 2.12.1** where they have to: draw a table of place values, complete numbers in the table, refer to the example and multiply by a two digit number to get the product.

- Move around in the class for facilitating pupils where necessary; ask probing questions guiding them to know that they multiply starting by the right side **multiplying by the ones**, to remember to carry a number where necessary, to jump one digit when you start to **multiply by the tens, and then to add to find the answer.**
- Invite some groups to present their findings and then help them to harmonize by explaining how to multiply a 3 digit number by a two digit number. Guide them to discover that this method is the same as *multiplying vertically or the standard written method.*
- Assign the same groups to do pair **Activity 2.12.2** and move around to each group to verify their performance;
- Ask some groups to present answers and then guide the class to harmonize by explaining how to do it.

d) Synthesis/summarization

- Guide pupils to summarize how to multiply a 3 digit number by a two digit number. Insist on the use of the standard written method which looks like the use of the table of values.

e) Assessment

- Provide application activities to be done by pupils (the application activity 2.12) and check their answers;
- Assign homework to all pupils.

f) Answer for activities

Activity 2. 12

a)	295	b) 198	c) 356	d) 139	e) 108	f) 209	g) 247	h) 169
	$\times 15$	$\times 19$	$\times 12$	$\times 34$	$\times 45$	$\times 23$	$\times 19$	$\times 24$
	4 425	3 762	4 272	4 726	4 860	4 807	4 693	4 056

Application activity 2.12

- | | | |
|-----------------------------|---------------------------|-----------------------------|
| a) $237 \times 21 = 4\ 977$ | d) $193 \times 25 = 4825$ | f) $317 \times 15 = 4\ 755$ |
| b) $159 \times 29 = 4\ 611$ | e) $219 \times 18 = 3942$ | g) $412 \times 12 = 4\ 944$ |
| c) $368 \times 13 = 4\ 784$ | | |

Note:

Concerning the lesson on word problems involving multiplication, the teacher will help pupils to solve a one –step or a two-step problem: guide them to *understand the problem, identify facts (given and requested), draw visual representations and solve the problem using the subtraction.*

Start by guiding pupils to solve some problems in groups or in a class discussion (use **activity 2.13**), provide problems to be solved into groups or in pairs and then give problems to be solved individually (**Application activity 2.13**).

Answers Activity 2.13

- 1) The total number of pineapples: $15 \times 316 = 4\,740$
- 2) The total number of eggs: $159 \times 30 = 4\,770$.

Answers for Application activity 2.13

Givens	Request	Solving
1) Number of rows: 28, Number of chairs for each row: 189.	Total number of chairs for the room	Number of chairs: $189 \times 28 = 5\,292$
2) Number of lines: 245, Each line has 19 soldiers.	The total number of all soldiers:	Total number of soldiers: $19 \times 245 = 4\,655$

Lesson 21-22: Division without a remainder of a 4-digit number less than 5000 by a 1-digit number

a) Objectives

Divide a 4-digit number and solve word problems involving the division of a number less than 5 000 by a one-digit number without a remainder.

b) Teaching resources and learning resources

- The table of place values;
- Different types of counters.
- Multiplication table for slow learners.

c) Teaching and learning activities:

This lesson can be taught like the lesson on division learnt in unit 1. The **activity 2.14.1** and the **activity 2.14.2** are the learning activities for this lesson.

– Pupils are guided on how to use the long division to get the answer:

$3321 \div 9 = \underline{\quad}$

<p>a) $3\,321 \div 9 = 369$</p> <pre style="font-family: monospace; margin: 0;"> 369 ----- 9) 3321 -27 --- 62 -54 --- 81 -81 --- 0 </pre>	<p>b) $4\,896 \div 8 = 612$</p> <pre style="font-family: monospace; margin: 0;"> 612 ----- 8) 4896 -48 --- 09 -8 --- 16 -16 --- 0 </pre>	<p>c) $4\,963 \div 7 = 709$</p> <pre style="font-family: monospace; margin: 0;"> 709 ----- 7) 4963 -49 --- 06 -0 --- 63 -63 --- 0 </pre>
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- Give them pair works and group work.
- Address misconceptions for every child.

d) Synthesis/summarization

Guide pupils to summarize how to divide. Insist on the use of the standard written method.

e) Assessment

- Provide application activities to be done by pupils (application activity 2.14) and check their answers.
- Assign homework to all pupils.

Note: Through the use of the activity 2.15 and application activity 2.15, word problems can be taught in another lesson.

f) Answer for activities

Application 2.14.1

- a) $3\ 975 : 3 = 1\ 325$ c) $4\ 985 : 5 = 997$ e) $4\ 256 : 7 = 608$
 b) $4\ 648 : 4 = 1\ 162$ d) $2\ 706 : 6 = 451$ f) $3\ 872 : 8 = 484$.

Application 2.14.2

- a) $4\ 095 : 5 = 819$ d) $4\ 864 : 8 = 661$ f) $4\ 868 : 4$
 b) $4\ 564 : 9 = 507$ e) $3\ 966 : 6 = 1\ 217$ g) $4\ 896 : 3 = 1\ 632$
 c) $4\ 856 : 7 = 708$

Application activity 2.14

1. a) $4\ 985 : 5 = 997$ c) $2\ 736 : 9 = 304$
 b) $3\ 872 : 8 = 484$ d) $4\ 963 : 7 = 709$
 2. a) $765 : 5 = 153$ b) $496 : 4 = 124$ c) $2\ 976 : 6 = 496$

Answers for pair assessment 2.15

	Givens	Request	Solving
1	Total number of book: 4 581. Number of schools: 9.	Number of books for each school= ?	number of books for each school = $4\ 581 : 9 = 509$
2	Number of health centers: 7 Total number of beds: 4 991.	Number of beds for each health center	Number of beds for each: $4\ 991 : 7 = 713$

Answers for self assessment 2.14

	Givens	Request	Solving
1	Total number of desks: 3 848. Number of schools: 8	Number of desks for each school = ?	Number of desks for each school is $3\ 848 : 8 = 481.$
2	Total number of iron sheets: 2 598 Number of carpenters: 6.	Number of iron sheets for each carpenter = ?	Number of iron sheets for each carpenter = $2\ 598 : 6 = 433.$
3.	The total number of cabbages: 4 764. Number of army stations: 4.	Number of cabbages for each army station = ?	Number of cabbages for each army station = $4764 : 4 = 1191$
4	Total number of sacks of cements: 4 365. Number of months: 3.	Number of sacks of cements for each month = ?	Number of sacks of cements for each month = $4\ 365 : 3 = 1\ 455$

2.6 Summary of the unit

Try to summarize the content for this unit.

2.7 Additional information for the teacher

- The teacher plays an important role in the learning activity, guide all learning situations and engage every pupil;
- Explain clearly how to complete numbers in a table of place values, how to compare numbers, how to arrange them and how to partition a number into thousand, hundreds, tens and ones.
- Guide them to be able to perform addition subtraction, multiplication and division of numbers;
- Use learning materials to illustrate the multiples of 7, 8, or 9; and how to multiply a number by a two digit number;
- Use word problems from the pupils' real life experience to address crosscutting issues during lessons where applicable;
- Try to use your creativity and innovation to apply the competence based approaches of teaching to cater all learning styles for your pupils.

2.8 Answers for the end unit assessment 2

1 a) Four thousand nine hundred and seventy eight.

2) a) 4 957 b) 3 769

3) a) 4 875

4) a) 6 Ones b) 2 Tens c) 3 tens d) 9 hundreds

5) a) $4\ 659 < 4\ 695$ b) $4\ 871 > 4\ 867$

6) 4 789, 4 798, 4 879, 4 897, 4 978, 4 987.

7) 3 876, 3 867, 3 786, 3 768, 3 678, 3 687

8) a) $3\ 154 + 1\ 659 = 4\ 813$ b) $3\ 876 + 1112 = 4\ 988$

9) a) $4\ 587 - 3\ 267 = 1320$ b) $3\ 967 - 2\ 563 = 1\ 404$.

10)a) 412	b) 105	c) 209	d) 124	e) 137	f) 108
$\times 12$	$\times 47$	$\times 19$	$\times 35$	$\times 36$	$\times 45$
4944	4935	3971	4340	4932	4860

11) a) $4\ 959 : 9 = 551$ d) $4\ 536 : 7 = 648$

b) $3\ 785 : 5 = 797$ e) $3\ 952 : 8 = 494$

c) $2\ 988 : 6 = 498$ f) $2\ 496 : 4 = 624$.

12) the number of all people in Nyakabanda cell: $879 + 839 + 3\ 267 = 4\ 985$

13) the number of men who attended trainings: $4\ 789 - 2\ 097 = 2\ 692$

14) the number of all planted trees in the village: $276 \times 18 = 4\ 968$

15) Number of sacks of cement every businessman got: $4\ 298 : 7 = 614$

2.9 Additional activities

a. Remedial activities.

1) Write in figures or in words

a) Two thousand, eight hundred.

b) 3 210:

2) Find the expanded number

a) $4\ 000 + 500 + 90 =$

b) $(1\ 000 \times 1) + (100 \times 3) + (10 \times 2) + (1 \times 2) =$

3) Use $<$, $>$ or $=$ to compare these numbers.

a) 1 500 5 000

b) 3 250 ... 3050

c) 4 380 ... 4 380

4) Arrange these numbers in ascending order:

1 800, 3 000, 4 500, 3 900

5) Arrange these numbers in descending order

2 900, 4 320, 3 710, 1 915

6) Work out

a) $2\,314 + 2\,135 =$ c) $321 \times 4 =$

b) $4\,786 - 3\,546 =$ d) $3\,963 : 3 =$

7) Solve the following problems

a) In the first term Mbabazi got 121 marks in mathematics. In the second term she got 131, and she got 143 in the third term. Determine the total number of marks for Mbabazi in 3 terms.

b) The Imena Village has 2 519 people. If only 2 307 people from them have health insurance. How many people of this village are without health insurance?

c) There are 112 benches in the board room. If 4 people can seat on each bench, how many people can seat in that room?

d) The center for vehicle inspection receives 2 469 vehicle in 3 days. If the number of vehicle inspected is the same for every day, calculate this number.

Answers for remedial activities

1) a) 2 800

b) Three thousand, two hundred ten.

2) a) 4 590

b) 1 322

3) a) $1\,500 < 5\,000$

b) $3\,250 > 3\,050$

c) $4\,380 = 4\,380$

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

5) 4 320, 3 710, 2 900, 1 915

6) a) 4 449

b) 1 240

c) 1 284

d) 1 321

7) a) The total number of marks for Mbabazi in 3 terms: $121 + 131 + 143 = 395$

b) People of this village are without health insurance: $2\,519 - 2\,307 = 212$

c) People who can seat in that room: $112 \times 4 = 448$

d) the number of vehicle inspected per day: $2\,469 : 3 = 823$.

b. Extension activities

1) Write in figures or in words:

a) 4 897 :

b) Three thousand, seven hundred ninety six:

2) Find the number that was decomposed.

a) 9 Hundreds 3 Tens 4thousand 4ones =

b) 5 tens 9 hundreds 8 ones 2thousand =

c) 8 ones 2 thousand 7 tens 4 hundreds =

3) Use $<$, $>$ or $=$ to compare these numbers

a) 3H 3T 2TH 7O 8O 3TH 9 T 7H c) 3O 4TH 5T 6H ... 4T 6H 8O 3TH

b) 8T 6H 4O 3TH 3H 5T 2TH 7O d) 5H 7T 4TH 9O ... 2O 4TH 4T 6H

4) Arrange these numbers in ascending order

4 539, 4 395, 4 953, 4 593, 4 359, 4 935,

5) Arrange these numbers in descending order

3 897, 3 798, 3 987, 3 978, 3 879, 3 789

6) Work out

a) $1\ 987 + 2\ 896 =$ c) $245 \times 19 =$

b) $5\ 000 - 2\ 879 =$ d) $4\ 984 : 7 =$

7) Solve these problems

a) In the last election, UWAMAHORO got 1 987 votes, GISA got 1 678 votes and MUDENGE got 989 votes . How many people did vote for all 3 people?

b) INGABIRE harvested 4 579 last year and gave 156 bananas to cohabitants. In addition, she took 365 bananas for poor families and other 197 for her own family. How many bananas remained for sales?

c) A cooperative of carpenter of carpenters makes 92 doors per day. How many doors does this cooperative in 49 days?

d) Share 4572 boxes of soaps among 9 boutiques. What is the share for each one?

Answers for extended activities

1) a) Four thousands, eight hundred ninety seven.

b) 3796

2) a) 4934

b) 2958

c) 2478

3) a) $4\ 934 > 3798$

c) $4\ 653 > 3648$

b) $3\ 684 > 2357$

d) $4\ 579 < 4642$

4) 4 359, 4 395, 4 539, 4 593, 4 935, 4 953.

3 987, 3 978, 3 897, 3 798, 3 789.

6) a) 4 883 b) 2 121 c) 4 655 d) 712

7) a) Number of people who voted for all 3 people: $1\,987 + 1\,678 + 989 = 4\,654$

b) Number of bananas remained for sales: $4\,579 - (156 + 365 + 197) = 3\,861$

c) Number of doors made per day: $92 \times 49 = 4\,508$ doors

d) Number of boxes for each boutique: $4\,572 \div 9 = 508$.

UNIT 3

NUMBERS UP TO 10 000

3.1 Key unit competence

Count, read, write, order, decompose, expand, compare, add, subtract and divide numbers up to 10 000.

3.2 Prerequisite

Pupils will easily learn this unit, if they have a good background on the following: to count, read, write, order, compare, add, subtract, multiply and divide numbers from 0 to 5 000.

3.3 Cross-cutting issues to be addressed

- **Gender balance:** provide equal opportunity to boys and girls in the lesson
- **Inclusive education:** promote education for all learners in the teaching and learning activities.
- **Environment and sustainability:** This will be addressed when pupils will be maintaining hygiene for their classroom and for materials they used.
- **Financial education:** addressed when pupils discuss word problem involving how to use money and how to manage learning materials or how to prepare activity plan.
- **Peace and values education:** addressed when pupils are encouraged to work collaboratively and peacefully in their group.

3.4 Sub-headings/ List of lessons

UNIT 3: NUMBERS FROM 0 UP TO 10 000 (40 periods)			Reinforcement and Extension	
	Lesson title	Learning objectives	Number of periods	
1	Introductory activity	Arouse the curiosity of learners on the importance of counting, reading and writing numbers.	1	
2	Reading numbers up to 10 000 in figures	Read numbers written in figures up to 10000.	1	
3	Writing numbers up to 10000 in figures	Write numbers written in figures up to 10000.	1	

4	Place value and expanded form of numbers	Expand a number between 0 and 10 000 into ones, tens, hundreds and thousands.	1	1
5	Writing numbers up to 10 000 in words	Write numbers from 0 to 10 000 in words.	1	1
6	Remediation	<i>Provide learning support to learners who are falling behind their peers</i>	1	
7	Comparing numbers less than or equal to 10 000	Compare numbers less than or equal to 10000.	1	1
8	Arranging numbers less than or equal to 10 000	Arrange numbers less than or equal to 10000 in ascending or descending order	2	
9	Addition of numbers whose sum does not exceed 10 000 without carrying	Add numbers whose sum does not exceed 10 000 without carrying.	2	1
10	Remediation	<i>Provide learning support to learners who are falling behind their peers</i>	1	
11	Addition of numbers whose sum does not exceed 10 000 with carrying	Add numbers whose sum does not exceed 10 000 with carrying.	2	
12	Word problems involving addition of numbers whose sum does not exceed 10 000	Solve word problems involving addition of numbers whose sum does not exceed 10000.	1	
13	Subtraction of numbers within 10 000 without borrowing	Subtract numbers within 10 000 without borrowing.	1	
14	Subtraction of numbers within 10 000 with borrowing	Subtract numbers within 10 000 with borrowing.	1	
15	Word problems involving subtraction of numbers within 10 000	Solve word problems involving subtraction of numbers within 10 000.	1	

16	Remediation	<i>Provide learning support to learners who are falling behind their peers</i>	1	
17	Multiplication of a 3 digit number by a 2 digit number where the product does not exceed 10 000	Multiply a 3 digit number by a 2 digit number where the product does not exceed 10 000.	2	1
18	Word problems involving multiplication of a 3 digit number by a 2 digit number where the product does not exceed 10 000	Solve word problems involving multiplication of a 3 digit number by a 2 digit number where the product does not exceed 10 000.	2	1
19	Multiply numbers by 100 and 1 000 where the product does not exceed 10 000	Multiply numbers by 100 and 1 000 where the product does not exceed 10 000.	1	
20	Remediation	<i>Provide learning support to learners who are falling behind their peers</i>	1	
21	Division without a remainder of a 4 digit number less than 10 000 by a one digit number	Divide a 4-digit number less than 10 000 by a one-digit number without a remainder.	2	1
22	Word problems involving the division of a number less than 10 000 by a one-digit number.	Solve word problems involving the division of a number less than 10 000 by a one-digit number.	2	1
23	End unit assessment	Count, read, write, expand, decompose, order, compare, add, subtract, multiply, divide numbers less than or equal to 10 000.	1	
24	Remediation	<i>Provide learning support to learners who are falling behind their peers</i>	1	
	Total		30	10

3.5 Guidance on different lessons for unit 3

Lesson 1: Guidance on introductory activity 3

- Invite pupils to read the story of Gakire who does not know how to manage the quantity of his production as a farmer.
- Guide pupils to discuss the reason one can fail to count the number of objects;
- Ask them to suggest what is required for every one of them to be able to count the quantity of many objects;
- Move around in the class to get aware of different suggestions and ask some probing questions where necessary.
- Invite all pupils to a class discussion and basing on their experience, prior knowledge and abilities shown in answering questions for this activity, open a discussion with probing questions to guide them to give their predictions and ensure that you arouse their curiosity on what is going to be learnt in this unit so that they may be able to manage different quantities of their properties.

Lesson 2: Reading numbers up to 10 000 in figures

a) Objectives

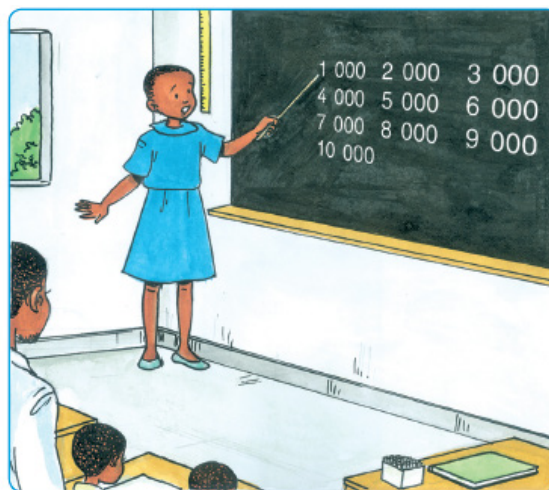
- Read numbers written in figures up to 10000.

b) Teaching resources and learning resources

- The table of place values;
- Number cards with different numbers between 5 000 and 10 000 in different colors;
- Different types of counters.

c) Teaching and learning activities:

This lesson is taught like the lesson on reading numbers up to 2000 seen in unit 1. However, it can be taught starting by reading and then trying to write numbers.



d) Synthesis/summarization

Guide pupils to read aloud the numbers written in figures up to 10 000.

e) Assessment

Provide application activities to pupils from the pupil's book asking them to write numbers in a table of place values, read loudly and write them in words.

f) Answer for activities

Answer for activity 3.1.1:

Guide pupils to read numbers correctly.

Example 6 000 is read **six thousand**.

Activity 3.1.2

1. Guide pupils to read numbers correctly.
2. Pupils can form different numbers the following are examples
 - a) 5 012, 5 013, 5 014, ..., 5 098.
 - b) 5 501, 5 502, 5 503,, 5 598.
 - c) 6 201, 6 203, 6 204, ..., 6 298.
 - d) 7 401, 7 402,..., 7 498.
 - e) 8 601, 8 602,..., 8 697.
 - f) 9 801, 9 802, ..., 9 876.

Remind pupils to use a digit **once** (because they are using number cards).

Guide pupils to read numbers correctly.

Application activity 3.1

Answers may be different.

Guide pupils to form numbers correctly.

Guide pupils to read the formed numbers correctly.

Examples:

- 5 012: Five thousand and twelve
- 6 789: Six thousand, seven hundred and eighty nine
- 8 976: eight thousand nine hundred and seventy six

Lesson 3: Writing numbers up to 10 000 in figures.

a) Objectives: Write numbers up to 10 000 in figures.

b) Teaching resources and learning resources

- Number cards with different digits
- Number cards made by different numbers up to 10 000 in different colors;
- Different types of counters.

c) Teaching and learning activities:

This lesson can be taught like the lesson on writing and reading numbers seen in unit 1.

Use activity 3.2.1 and activity 3.2.2 from the pupil's book.

d) Synthesis/summarization

Guide pupils to write in figures the numbers up to 10 000.

e) Assessment

Guide pupils to write correctly the missing numbers and to form numbers using number cards (**see Application activity 3.2**).

– Guide learners to read their formed numbers.

f) Answer for activities

Activity 3.2.1

Guide pupils to discover the common difference so that they may count:

- a) 5 100, 5 300, 5 500, 5 700, 5 900
- b) 6 050, 6 150, 6 250, 6 350, 6 450
- c) 8 200, 8 600; 9 000, 9 400, 9 800

Activity 3.2.2

Answers may vary:

5 123, 5 124, 5 213, 5 214, ..., 5 431, 5 432.

Note:

Guide pupils to read numbers correctly.

Remind pupils to use 5 in place of thousands.

Application activity 3.2

- 1) 234, 8 243, 8 324, 8 342, 8 423, 8 432.

Note that for this case, in place of thousand we use 8 and a given digit is used once; guide pupils to read numbers correctly.

- 2) 9 199, 9 399, 9 599, 9 799, 9 999.
- 3) a) 9 794: nine thousand, seven hundred and ninety four
- b) 6 805: six thousand, eight hundred and five
- c) 6 732: six thousand, seven hundred and thirty two

Lesson 4: Place value of digits of numbers up to 5000

a) Objectives

Expand a number between 0 and 10 000 into ones, tens, hundreds and thousands

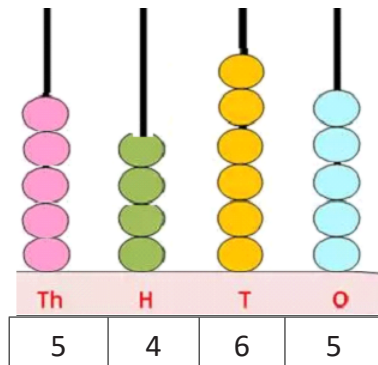
b) Teaching resources and learning resources

- Abacus
- The table of place values;
- Number cards with different numbers between 1000 and 5 000 in different colors;
- Different types of counters.

c) Teaching and learning activities:

This lesson is taught like the lesson on place values and expanded form of numbers up to 2000 seen in unit 1. You will use **activity 3.3.1**, **activity 3.3.2**, **activity 3.3.3**, **activity 3.4.1**, **activity 3.4.2** and **Activity 3.4.3**.

Example: To show the place values for digits of the number 5465.



The number 5 465 is composed with 5 Thousands, 4 Hundreds, 6Tens and 5Ones.

Thousands (Th)	Hundreds (H)	Tens (T)	Ones (O)
5	4	6	5

d) Synthesis/summarization

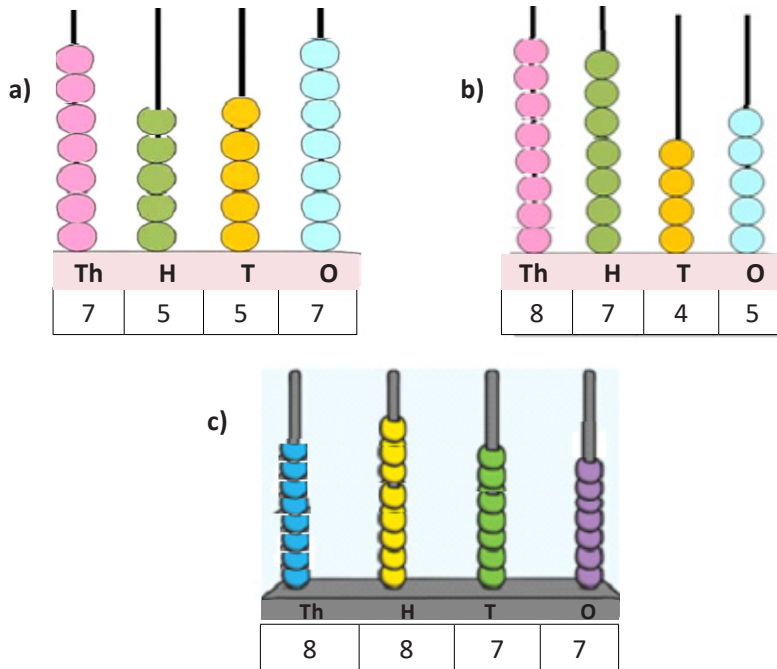
Guide pupils to summarize how to draw a table of place value, how to complete a number in such a table and how to partition that number into thousands (Th), hundreds (H), tens (T) and ones (O).

e) Assessment

- Provide application activities to be done by pupils (see **application activity 3.3**) and check their answers;
- Assign all pupils to do the **Application 3.4** as homework.

f) Answer for activities

Activity 3.3.1



Activity 3.3.2:

Thousands	Hundreds	Tens	Ones
5	4	6	5
6	3	9	2
7	9	6	8
8	9	7	4
9	5	3	9
6	7	4	9

Guide pupils to be able to explain the decomposition of each number.

Activity 3.3.2:

- a) 28 654 = ...Thousands...Hundreds ...Tens...Ones.
- b) 6 974 = ...Tens...Thousands...Ones...Hundreds.
- c) 7 935= ...Hundreds...Ones...Thousands... Tens.
- d) 5 923 = ...Ones...Hundreds...Tens...Thousands.
- e) 6 179 = ...Tens...Hundred...Thousands...Ones.
- f) 9 756 = ...Hundreds...Ones...Thousands... Tens.

3) The number that was decomposed:

- a) 6 thousands, 7 tens, 5 ones and 3 hundreds = 6 375
- b) 9 ones, 6 hundreds, 7 thousands and 1 tens = 7 619
- c) 7 hundreds, 4 ones, 6 tens and 5 thousands = 5 764
- d) 5 tens, 8 hundreds, 8 thousands and 9 ones = 8 859
- e) 7 ones 9 tens 9 thousands and 9 hundreds = 9 997
- f) 9 tens, 7 thousands, 4 ones and 4 hundreds = 7 494

Application activity 3.3

- a) 9Thousands b) 7ones c) 2hundreds d) 5 tens
- e) 5 thousands f) 5 hundreds.

Activity 3.4.1

- a) $6\ 248 = 6\ 000 + 200 + 40 + 8$
- b) $5\ 879 = (5 \times 1\ 000) + (8 \times 100) + (7 \times 10) + (9 \times 1)$
- c) 7 574 = 7Thousands + 5 Hundreds + 7 Tens + 4 Ones.
- d) $7\ 649 = 7\ 000 + 600 + 40 + 9$.
- e) $6\ 719 = (6 \times 1\ 000) + (7 \times 100) + (1 \times 10) + (9 \times 1)$.
- f) $8\ 659 = 8\ \text{Thousands} + 6\ \text{Hundreds} + 5\ \text{Tens} + 9\ \text{Ones}$.

Activity 3.4.2

- a) 8 547 b) 9 876 c) 7 250

Activity 3.4.3

- a) 6 thousands, 7 tens, 5 ones and 3 hundreds = 6 375
- b) 9 ones, 6 hundreds, 7 thousands and 1 tens = 7 619
- c) 7 hundreds, 4 ones, 6 tens and 5 thousands = 5 764
- d) 5 tens, 8 hundreds, 8 thousands and 9 ones = 8 859
- e) 7 ones 9 tens 9 thousands and 9 hundreds = 9 997
- f) 9 tens, 7 thousands, 4 ones and 4 hundreds = 7 494

Application activity 3.4.3

- 1) a) $8\ 567 = 8\ \text{thousands} + 5\ \text{hundreds} + 6\ \text{tens} + 7\ \text{ones}$.
- b) $7\ 526 = 7\ \text{thousands} + 5\ \text{hundreds} + 2\ \text{tens} + 6\ \text{ones}$
- c) $9\ 615 = 9\ \text{thousands} + 6\ \text{hundreds} + 1\ \text{tens} + 5\ \text{ones}$
- d) $6\ 452 = 6\ \text{thousands} + 4\ \text{hundreds} + 1\ \text{ten} + 2\ \text{ones}$
- e) $6\ 435 = 6\ \text{thousands} + 4\ \text{hundreds} + 3\ \text{tens} + 5\ \text{ones}$
- f) $7\ 361 = 7\ \text{thousands} + 3\ \text{hundreds} + 6\ \text{tens} + 1\ \text{one}$.

- 2) a) 8 ones, 5 thousands, 7 tens, 9 hundreds = 5 978
 b) 3 ones, 6 tens, 3 thousands, 1 hundreds = 6 163
 c) 3 tens, 7 thousands, 6 ones, 7 hundreds = 7 736
 d) 5 hundreds, 8 ones, 7 tens, 2 thousands = 2 578
 e) 8 hundreds, 2 ones, 9 thousands, 7 tens = 9 872
 f) 3 ones, 8 thousands, 7 tens, 6 hundreds = 8 673

Lesson 5: Writing numbers up to 10 000 in words

a) **Objectives:** Write numbers up to 10 000 in words.

b) **Teaching resources and learning resources**

- Abacus or table of place values
- Number cards made by different numbers up to 10 000 in different colors.

c) **Teaching and learning activities:**

- This lesson is taught like the lesson on writing numbers up to 2000 in words at it was seen in unit 1. But numbers to be written are less than or equal to 10 000.
- Start by expanded form and guide them how they can write numbers in words

Example:

Number	Expanded form	Number in words
9 763	9 000 + 700 + 60 + 3	Nine thousand, seven hundred and sixty-three.
___	___	Seven thousand, four hundred and eighty-two
9 999	___	___
___	___	Four thousand, nine hundred and ninety-nine
10 000	___	___

Use the activity 3.5.1 and activity 3.5.2.

d) **Synthesis/summarization**

Guide pupils to write numbers in words using a table of place values: Insist on the fact of removing “s” on each period and insert “and” after the first digit in every group of 3 numbers (hundreds) that contain tens or units.

e) **Assessment**

- Provide application activities to be done by pupils (use the **Application activity 3.5**) and check their answers;
- Assign all pupils to do the **Application activity 3.5** as homework.

f) Answer for activities

Activity 3.5.1

Number	Expanded form	Number in words
7 482	7000+400+80+2	Seven thousand four hundred and eighty two
9 999	9000+900+90+9	Nine thousand nine hundred and ninety nine
4 999	4000+900+90+9	Four thousand nine hundred and ninety nine
10 000	10 000	Ten thousand

Application activity 3.5

a) $5\ 211 = 5\ 000 + 200 + 10 + 1$

5 211: five thousand two hundred and eleven.

b) $6\ 417 = 6\ 000 + 400 + 10 + 7$

6 417: six thousand, 4 hundred and seventeen.

Lesson 6: Remediation

Organize a lesson in which you *provide learning support to learners who are falling behind their peers*.

Lesson 7: Comparing numbers less than or equal to 10 000

a) Objectives

Compare numbers less than or equal to 10000

b) Teaching resources and learning resources

- The table of place values;
- Number cards with different numbers between 5 000 and 10 000 in different colors;
- Different types of counters.

c) Teaching and learning activities:

This lesson is taught like the lesson on the comparison of numbers up to 2000 seen in unit 1. But numbers to be compared are between 5 000 and 10 000. **Example:**

To compare **6543** and **9876**;

Guide pupils to use the abacus, base ten blocks or the table of place value to compare digits for each place value. Then, facilitate them to conclude on the number which is greater than the other.

Thousands	Hundreds	Tens	Ones
9	8	7	6
6	5	4	3

6543 is smaller than **9876**.

It is written as follows: $6\ 543 < 9\ 876$

Use the **activity 3.6.1**, **activity 3.6.2**, **activity 3.6.3** and **activity 3.6.4**.

d) Synthesis/summarization

Guide pupils to summarize how to compare numbers using a table of place values: Insist on the comparison of thousands (Th), hundreds (H), tens (T) and ones (O).

e) Assessment

- Provide application activities to be done by pupils and check their answers;
- Assign all pupils to do the **application activity 3.6** as homework.

f) Answer for activities

Activity 3.6.1

a) $7\ 456 < 8\ 336$

b) $9\ 576 > 9\ 321$

Activity 3.6.3

a) $9\ 723 > 9\ 327$

c) $7\ 215 > 7\ 152$

e) $5\ 241 < 7\ 514$

b) $6\ 472 < 6\ 742$

d) $8\ 617 > 6\ 817$

f) $6\ 072 = 6\ 072$

Activity 3.6.4

a) $7\ 865 < 9\ 876$

d) $9\ 876 > 8\ 654$

f) $7\ 865 < 9\ 876$

b) $7\ 865 > 8\ 654$

e) $9\ 876 > 6\ 896$

g) $8\ 654 > 6\ 896$.

c) $7\ 865 > 6\ 896$.

Application activity 3.6

1. a) $2\ 087 > 1\ 678$

b) $2\ 087 < 6\ 167$

c) $1\ 678 > 6\ 167$

2. a) $8\ 459 = 8\ 459$

c) $9\ 628 < 9\ 657$

e) $6\ 734 = 6\ 734$

b) $7\ 384 > 7\ 249$

d) $5\ 493 > 5\ 234$

f) $7\ 835 < 8\ 435$

Lesson 8: Arrange numbers between 5 000 and 10 000 in ascending or descending order

This lesson can be taught in **two different lessons**: arranging numbers in ascending order and the second related to arranging numbers in descending order.

a) Objectives

Arrange numbers less than or equal to 10 000 in ascending or descending order.

b) Teaching resources and learning resources

- The table of place values;

- Number cards with different numbers between 5 000 and 10 000 in different colors;
- Different types of counters.

c) Teaching and learning activities:

This lesson for arranging numbers between 5 000 and 10 000 in ascending or descending order is taught in the same way as the lesson of arranging numbers between 0 and 1 000 learnt in the unit one.

Guide pupils to use abacus, base ten blocks and the place value table to represent numbers, they compare them to deduce the smallest the greatest and then order them accordingly.

Use the activity **3.7.1**, **activity 3.7.2**, **activity 3.5.3** and **activity 3.7.4**.

d) Synthesis/summarization

- Guide pupils to summarize how to arrange numbers in an ascending order and in a descending order. Insist on the use of table of values to guide the comparison and then the arrangement of numbers.

e) Assessment

- Provide application activities to be done by pupils (the **application activity 3.7.1** and **application activity 3.7.2**) and check their answers.
- Assign homework to all pupils.

f) Answer for activities

Activity 3.7.1

- Munanira II
- Nyakabanda II
- Nyakabanda II, Munanira I, Nyakabanda I, Munanira II

Activity 3.7.2

- 5 386; 6 218; 7 804.
- 5 748; 6 804; 7 358.

Application activity 3.7.1

- 6 439, 7 564, 8 943, 9 754, 9 825. 3) 5 739, 7 193, 7 496, 8 049, 9 384
- 5 482, 6 357, 6 497, 7 845, 8 015. 4) 6 427, 7 409, 8 274, 8 391, 9 437



Activity 3.7.3

- | | |
|------------------------|-------------------------|
| 1) 9 354, 6 507, 5 734 | 3) 8 654, 6 901, 5 789. |
| 2) 9 675, 6 709, 5 084 | 4) 8 765, 6 057, 5 293. |

Activity 3.7.4

- | | |
|-------------------------|-------------------------|
| a) 8 534, 7 483, 5 192. | c) 8 976, 7 456, 6 012. |
| b) 9 567, 7 345, 6 978. | d) 9 271, 7 105, 6 823. |

Application activity 3.7.2

- a) 9 325, 5 923, 5 392 b) 6 541; 6 154; 5614; 5 146. c) 9 876, 7 698, 6789.

Lesson 9-12: Addition of numbers whose sum does not exceed 10 000

a) Objectives

Add numbers and solve word problems involving addition of numbers whose sum does not exceed 10 000.

b) Teaching resources and learning resources

- The table of place values;
- Number cards with different numbers between 5 000 and 10 000 in different colors;
- Different types of counters.

c) Teaching and learning activities:

- This lesson can be taught like the lesson on addition learnt in unit 1. As a teacher, you can teach it in **3 different lessons**: start by teaching addition without carrying, addition with carrying and then word problem involving addition.
- Before the explanation on procedures, use base ten blocks or the abacus to add numbers.

Then after, guide learners to add in a formal written method:

Example:

$$7\ 698 + 1\ 479 = \underline{\hspace{2cm}}$$

Fourth	Third	Second	First
Finally, I add thousands: $7+1=8$; $8+1=9$	I add hundreds: $6+4=10$. $10+1=11$. I write 1 and carry 1 to thousands.	I add tens: $9+7=16$. $16+1=17$. I write 7 and carry 1 to hundreds.	I add ones, $8+9=17$. I write 7 and carry 1 to tens.
Thousands	Hundreds	Tens	Ones
1	1	1	
7	6	9	8
+ 1	4	7	9
9	1	7	7

Then, $7\ 698 + 1\ 479 = 9\ 177$

- The guiding learning activities are **activity 3.8.1**, **activity 3.8.2**, **activity 3.8.3**, **activity 3.8.4** and the **activity 3.9**.

d) Synthesis/summarization

- Guide pupils to summarize how to add numbers without or with carrying. Insist on the use of the standard written method which looks like the use of the table of values.

e) Assessment

- Assign pupils to work in pair, work out **activity 3.8.2** and **activity 3.9** and verify their answers
- Provide activities to be done by pupils (**application activity 3.8.1** and **application activity 3.8.2**) and check their answers;
- Assign homework to all pupils (**application activity 3.9**) .

f) Answer for activities

Activity 3.8.1

a) $6\ 543$	b) $4\ 567$	c) $5\ 123$	d) $9\ 217$	e) $8\ 012$
$+ 2\ 310$	$+ 3\ 421$	$+ 3\ 754$	$+ 682$	$+ 987$
$\underline{8\ 853}$	$\underline{7\ 988}$	$\underline{8\ 877}$	$\underline{9\ 899}$	$\underline{8\ 999}$

Activity 3.8.2

1. a) $4\ 125 + 3\ 873 = 7\ 998$ c) $5\ 234 + 4\ 543 = 9\ 777$ e) $5\ 715 + 4\ 054 = 9\ 769$
b) $3\ 756 + 132 = 3\ 888$ d) $3\ 256 + 732 = 3\ 988$ f) $4\ 650 + 4\ 239 = 8\ 889$
2. a) $4\ 567 + 5\ 231 = 9\ 798$. d) $7\ 345 + 1\ 643 = 8\ 988$. f) $9\ 456 + 442 = 9\ 898$.
b) $5\ 678 + 4\ 321 = 9\ 999$. e) $8\ 012 + 1\ 986 = 9\ 998$. g) $4\ 567 + 4\ 302 = 8\ 869$.
c) $6\ 123 + 2\ 874 = 8\ 997$.

Application activity 3.8.1

- a) $5\ 643 + 2\ 56 = 5\ 899$ c) $4\ 572 + 4\ 316 = 8\ 888$
b) $7\ 215 + 2\ 784 = 9\ 999$ d) $4\ 567 + 421 = 4\ 988$

Activity 3.8.3

- a) $1\ 943 + 7\ 689 = 9\ 632$. c) $3\ 987 + 5\ 679 = 9\ 666$. e) $5\ 795 + 3\ 498 = 9\ 293$.
b) $2\ 976 + 6\ 387 = 9\ 363$. d) $4\ 239 + 4\ 876 = 9\ 115$. f) $6\ 467 + 2\ 944 = 9\ 411$.

Activity 3.8.4

- a) $3\ 294 + 5\ 789 = 9\ 083$. b) $6\ 095 + 2\ 987 = 9\ 082$ c) $5\ 324 + 3\ 678 = 9\ 002$.
d) $4\ 852 + 4\ 897 = 9\ 749$ e) $7\ 689 + 1\ 567 = 9\ 256$. f) $8\ 437 + 1\ 389 = 9\ 826$.

Application activity 3.8.2

a) $7\ 568$	b) $8\ 532$	c) $9\ 274$	d) $6\ 765$	e) $4\ 723$
$+ 1\ 928$	$+ 987$	$+ 389$	$+ 2\ 579$	$+ 5\ 187$
$9\ 496$	$9\ 519$	$9\ 663$	$9\ 344$	$9\ 910$

The lesson on word problems involving addition:

- Help pupils to solve a one –step or a two-step problem:
- Guide them to understand the problem,
- Identify facts (given and requested),
- Draw visual representations and solve the problem using the addition.
- Start by guiding pupils to solve some problems in groups or in a class discussion (use **activity 3.9**), provide problems to be solved into groups or in pairs and then give problems to be solved individually (**application activity 3.9**).

Answers for activity 3.9

N°	Givens	Request	Formula and calculation
1	Number of boys vaccinated: 5 321. Number of girls vaccinated: 3 789.	Number of all children vaccinated = ?	Number of all children vaccinated: $5\ 321 + 3\ 789 = 9\ 110$
2	Number of coffee seedlings planted last year: 3 657. Coffee seedlings planted this year: 5 794.	Number of all coffee seedlings planted = ?	Number of all coffee seedlings planted: $3\ 657 + 5\ 794 = 9\ 451$
3	Number of cows distributed in the first district: 5 423. Number of cows distributed in the second district 3 798.	Total number of cows distributed =?	Total number of cows distributed: $5\ 423 + 3\ 798 = 9\ 221$
4	Number of boy students: 3 456. Number of girls students: 4 649.	Total number of all students = ?	Total number of all students: $3\ 456 + 4\ 649 = 8\ 105$

Answers for application activity

N°	Givens	Request	Formula and calculation
1	The number of male spectators: 7 543. The number of female spectators: 1 978.	The total number of spectators = ?	The total number of spectators: $7\ 543 + 1\ 978 = 9\ 521$
2	Number of families for Kamurehe sector: 4 987. Number of families for Kabuye sector 4 678.	Total number of families = ?	Total number of families = $4\ 987 + 4\ 678 = 9\ 665$
3	Mathematics books distributed in Karongi: 3 576. Mathematics books distributed in Ngororero: 5 879.	Total number of books distributed = ?	Total number of books distributed = $3\ 576 + 5\ 879 = 9\ 455$

Lesson 13: Subtraction of numbers within the range of 10 000

a) Objectives

Subtract numbers and solve word problems involving subtraction of numbers that do not exceed 10 000.

b) Teaching resources and learning resources

- The table of place values;
- Number cards with different numbers between 5 000 and 10 000 in different colors;
- Different types of counters.

c) Teaching and learning activities:

- This lesson can be taught like the lesson on subtraction learnt in unit 1. However, you can teach it in **3 different lessons**: start by teaching subtraction without borrowing, subtraction with borrowing and then the lesson on word problem involving subtraction.
- In each lesson, start by the use of abacus or base ten blocks to show how to take away a number of beads or blocks,
- Use the table of place value to show how numbers are arranged, then use the standard written method to subtract numbers.

Example:

$$6\ 789 - 5\ 676 = \underline{\quad}$$

I subtract thousands from thousands	I subtract hundreds from hundreds	I subtract tens from tens	I subtract ones from ones
Thousands	Hundreds	Tens	Ones
6	7	8	9
- 5	6	7	6
1	1	1	3

Then, $6\ 789 - 5\ 676 = \mathbf{1\ 113}$

- The guiding learning activities are **activity 3.10.1, activity 3.10.2, activity 3.10.3, activity 3.10.4** and **the activity 3.11**. respectively.

d) Synthesis/summarization

- Guide pupils to summarize how to subtract numbers. Insist on the use of the standards written method which looks like the use of the table of values.
- During the subtraction with borrowing, address misconceptions by providing more explanations. Refer to the example given in the pupil's book as follows:

Example:

$$9\ 531 - 6\ 789 =$$

Subtract using a place value table				Subtract vertically
Thousands	Hundreds	Tens	Ones	$ \begin{array}{r} & 14 & 12 & 11 \\ & 8 & 4 & 2 \\ & 9 & 5 & 3 & 1 \\ - & 6 & 7 & 8 & 9 \\ \hline & 2 & 7 & 4 & 2 \end{array} $
8	4	2		
9	5	3	1	
- 6	7	8	9	
2	7	4	2	

Therefore, $9\,531 - 6\,789 = 2742$

Explanations:

We have $9531 - 6789 =$

- I write the second number under the first number as per place values: ones under ones, tens under tens, hundreds under hundreds and thousands under thousands.
- I subtract starting from the right:
 - **For Ones:** $1 - 9$ is impossible, I borrow 1 ten from 3 and I get $10 + 1 = 11$. Then, $11 - 9 = 2$
 - **For tens:** I remained with $3 - 1 = 2$. Then, $2 - 8$ is impossible, I borrow 1 hundred from 5. I get $10 \text{ tens} + 2 \text{ tens} = 12 \text{ tens}$. Then, $12 - 8 = 4$.
 - **For hundreds:** I remained with $5 - 1 = 4$. Then, $4 - 7$ is impossible, I borrow 1 thousand from 9. I get $10 \text{ hundreds} + 4 \text{ hundreds} = 14 \text{ hundreds}$. Then, $14 - 7 = 7$.
 - **For thousands:** I remained with $9 - 1 = 8$. Then, $8 - 6 = 2$.

Therefore, $9\,531 - 6\,789 = 2742$.

e) Assessment

- Assign pupils to work in pair, do **activity 3.10.2** or **activity 3.10.4** and verify their answers.
- Provide activities to be done by pupils and check their answers.
- Assign a homework to be done by pupils (you can use (**application activity 3.10.1** or **application activity 3.10.2**)).

f) Answer for activities

Activity 3.10.1

Guide pupils to use a table of place value or a standard written method:

a) $\begin{array}{r} 8\ 569 \\ - 5\ 417 \\ \hline 3\ 152 \end{array}$	b) $\begin{array}{r} 9\ 738 \\ - 6\ 315 \\ \hline 3\ 423 \end{array}$	c) $\begin{array}{r} 7\ 685 \\ - 5\ 452 \\ \hline 2\ 233 \end{array}$	d) $\begin{array}{r} 8\ 679 \\ - 7\ 543 \\ \hline 1\ 136 \end{array}$	e) $\begin{array}{r} 6\ 974 \\ - 6\ 432 \\ \hline 542 \end{array}$
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Activity 3.10.2

a) $9\ 876 - 7\ 645 = 2\ 231$	e) $9\ 234 - 6\ 023 = 3\ 211$
b) $8\ 567 - 5\ 435 = 3\ 132$	f) $8\ 456 - 5\ 031 = 3\ 425$
c) $7\ 456 - 4\ 142 = 3\ 314$	g) $7\ 986 - 3\ 654 = 4\ 332$
d) $6\ 345 - 4\ 203 = 2\ 142$	

Application activity 3.10.1

a) $\begin{array}{r} 8\ 589 \\ - 5\ 046 \\ \hline 3\ 543 \end{array}$	b) $\begin{array}{r} 7\ 953 \\ - 5\ 720 \\ \hline 2\ 233 \end{array}$	c) $\begin{array}{r} 6\ 789 \\ - 5\ 417 \\ \hline 1\ 372 \end{array}$	d) $\begin{array}{r} 5\ 765 \\ - 3\ 612 \\ \hline 2\ 153 \end{array}$
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Activity 3.10.3

a) $\begin{array}{r} 7\ 234 \\ - 5\ 897 \\ \hline 1\ 337 \end{array}$	b) $\begin{array}{r} 6\ 013 \\ - 5\ 739 \\ \hline 274 \end{array}$	c) $\begin{array}{r} 9\ 543 \\ - 8\ 796 \\ \hline 747 \end{array}$	d) $\begin{array}{r} 8\ 250 \\ - 6\ 592 \\ \hline 1\ 658 \end{array}$	e) $\begin{array}{r} 5\ 123 \\ - 2\ 768 \\ \hline 2\ 355 \end{array}$
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Activity 3.10.4

a) $5\ 321 - 2\ 789 = 2\ 532$	d) $8\ 143 - 6\ 759 = 1\ 384$	f) $6\ 503 - 3\ 967 = 2\ 536$
b) $6\ 024 - 4\ 658 = 1\ 366$	e) $9\ 012 - 8\ 945 = 67$	g) $8\ 432 - 6\ 579 = 1\ 853$
c) $7\ 431 - 5\ 865 = 1\ 566$		

Application activity 3.10.2

a) $6\ 120 - 3\ 249 = 2\ 871$	c) $8\ 105 - 5\ 258 = 2\ 847$
b) $7\ 432 - 4\ 567 = 2\ 865$	d) $9\ 043 - 6\ 398 = 2\ 645$

The lesson on word problems involving subtraction,

- Follow required steps for solving a word problem as they were given in previous concepts.
- Start by guiding pupils to solve some problems in groups or in a class discussion (use **activity 3.11**), provide problems to be solved into groups or in pairs and then give problems to be solved individually (**application activity 3.11**).

Answers for activity 3.11

- 1) The number of refugees who didn't receive donations: $9\,732 - 7\,986 = 1\,746$.
- 2) The number of students who are boys: $9\,321 - 5\,867 = 3\,454$.
- 3) The number of families which did not receive mosquito nets: $6\,830 - 5\,987 = 843$.

Answers for application 3.11

- 1) Number of cabbages he remained with: $7\,120 - 6\,987 = 133$
- 2) The number of children who received all vaccinations: $9\,123 - 879 = 8\,244$
- 3) The number of candidates who did not selected: $7\,345 - 789 = 6\,556$
- 4) The number of all seedlings which were not grown up: $9\,351 - 7\,984 = 1\,367$

Lesson 14: Multiply a two-digit or three-digit number by a two digit number

a) Objectives

Multiply a 3 digit number by a 2 digit number and solve word problems involving multiplication of a 3 digit number by a 2 digit number where the product does not exceed 10 000.

b) Teaching resources and learning resources

- The table of place values;
- Different types of counters.
- Multiplication table for slow learners.

c) Teaching and learning activities:

This lesson for multiplying a three digit number by a two digit number where the product does not exceed 10 000 is taught like the lesson on the multiplication taught in unit 2.

Use the **activity 3.12.1** and **activity 3.12.2**.

- Provide explanations as pupils can have the misconception on where they can write the answer.

Example: $325 \times 29 = \underline{\quad}$

Thousands	Hundreds	Tens	Ones
	3	2	5
1	×	2	9
2	9	2	5
+ 6	5	0	
9	4	2	5

Steps:

- 1) I multiply 325 by 9 ones:
 $325 \times 9 = 2925$
- 2) I Multiply 325 by 2 tens:
 $325 \times 2 = 650$
- 3) I add the 2 products.

$$\begin{array}{r}
 325 \\
 \times 29 \\
 \hline
 2925 \\
 + 650 \downarrow \\
 \hline
 9425
 \end{array}$$

d) Synthesis/summarization

Guide pupils to summarize how to multiply a 3 digit number by a two digit number. Insist on the use of the standard written method which looks like the use of the table of values.

e) Assessment

- Provide application activities to be done by pupils (the **application activity 3.12**) and check their answers.
- Assign homework to all pupils.

f) Answer for activities

Activity 3. 12.1

a) 295	b) 198	c) 356	d) 139	e) 108
$\times 15$	$\times 19$	$\times 12$	$\times 34$	$\times 45$
4 425	3 762	4 272	4 726	4 860

Activity 3. 12.2

- | | | |
|-----------------------------|-----------------------------|---------------------------|
| a) $378 \times 25 = 9\,450$ | d) $439 \times 21 = 9\,219$ | f) $907 \times 11 = 9977$ |
| b) $529 \times 18 = 9\,522$ | e) $297 \times 29 = 8\,613$ | g) $412 \times 24 = 9888$ |
| c) $638 \times 15 = 9\,570$ | | |

Application activity 3. 12

a) 789	b) 697	c) 874	d) 527	e) 472
$\times 12$	$\times 13$	$\times 11$	$\times 15$	$\times 16$
9 468	9 061	9 614	7 905	7 552

Note on the lesson on word problems involving multiplication,

- Help pupils to solve a one –step or a two-step problem: guide them to understand *the problem*, *identify facts (given and requested)*, *draw visual representations and solve the problem using the subtraction*.

– Start by guiding pupils to solve some problems in groups or in a class discussion (use **activity 3.13**), provide problems to be solved into groups or in pairs and then give problems to be solved individually (**application activity 3.13**).

Activity 3.13

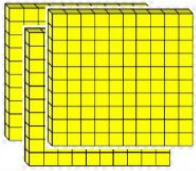
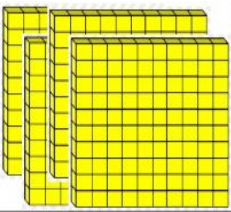
- 1) The total number of cows received by 416 sectors: $416 \times 23 = 9\ 568$.
- 2) The total number of people in the meeting hall: $798 \times 12 = 9\ 576$.
- 3) The number of students to be in 29 schools: $287 \times 29 = 8\ 323$
- 4) Total number of chicks produced by all hens every year: $479 \times 18 = 8\ 622$

Application activity 3.13

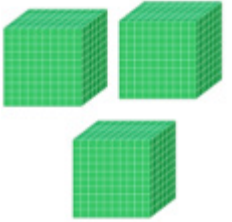
- 1) The number of eggs to be produced by all hens every month: $278 \times 29 = 7\ 784$
- 2) The number of boxes of mineral water to be produced by a factory in 27 days: $367 \times 27 = 9\ 909$.
- 3) The number of cabbages she planted: $549 \times 18 = 9\ 882$
- 4) The total number of sellers: $589 \times 15 = 8\ 835$.

Lesson on the multiplication by 100 and 1000

- This lesson is taught like the lesson on multiplication by 100 and 1000 seen in unit 1.
- Start by small numbers and use base ten blocks to let pupils find that when they have for **example** 3 flats, the number represented is 3 times 100 which is 300 (3 with two zeros).

Hundreds	Number of flats	Total number of units	Multiplication by 100
	3	300	$3 \times 100 = 300$
	4	400	$4 \times 100 = 400$

- Use base ten blocks to let pupils find that when they have for example 3 cubes, the number represented is 3 times 1000 which is 3000 (3 with three zeros).

Thousands	Number of cubes	Total number of units	Multiplication by 1000
	3	3000	$3 \times 1000 = 3000$

– Refer to **activity 3.14.1**, **activity 3.14.1** and the **application activity 3.14** to teach a lesson showing learners how to multiply bigger numbers by 100 and 1000 where the product does not exceed 10 000.

Answers for activity 3.14.1

- 1) $8 \times 1\,000 = 8\,000$ 3) $67 \times 100 = 6\,700$
 2) $9 \times 1\,000 = 9\,000$ 4) $5 \times 1\,000 = 5\,000$

Answers for activity 3.14.2

- a) $99 \times 100 = 9\,900$. c) $6 \times 1\,000 = 6\,000$. e) $57 \times 100 = 5\,700$.
 b) $7 \times 1\,000 = 7\,000$. d) $78 \times 100 = 7\,800$. f) $9 \times 1\,000 = 9\,000$.

Answer for application activity 3.14

- a) $1\,000 \times 3 = 3\,000$ d) $87 \times 100 = 8\,700$ g) $6 \times 1\,000 = 6\,000$
 b) $69 \times 100 = 6\,900$ e) $1\,000 \times 7 = 7\,000$ h) $5 \times 1\,000 = 5\,000$
 c) $8 \times 1000 = 8\,000$ f) $76 \times 1\,000 = 7\,600$.

Lesson 15: Division without a remainder of a 4-digit number less than 10 000 by a one digit number

a) Objectives

Divide a 4-digit number and solve word problems involving the division of a number less than 10 000 by a one-digit number without a remainder

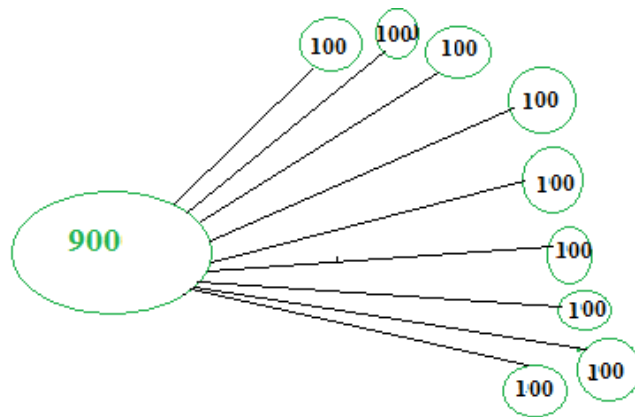
b) Teaching resources and learning resources

- The table of place values;
- Different types of counters.
- Multiplication table for slow learners.

c) Teaching and learning activities:

- This lesson can be taught like the lesson on the division learnt in unit 1.
- Start by the representation of what the division mean

Example: When 9 pupils need to share 900 notebooks.



Pupils can think and say that each pupil will take 100 notebooks.

- Refer to their response and guide them on how they can get the correct answer by using the long division method.
- Form groups and assign them the tasks
- Use the activity 3.15.1 and the activity 3.15.2 as guiding learning activities for this lesson.

$$\begin{array}{r}
 \text{100} \\
 9 \overline{) 900} \\
 \underline{-9} \\
 00 \\
 \underline{-0} \\
 00 \\
 \underline{-0} \\
 0
 \end{array}$$

Example:

a) $9\ 819 \div 9 = ?$

b) $8\ 712 \div 8 = ?$

Guide pupils and explain how to use the long division method:

$$\begin{array}{r}
 \text{1091} \\
 9 \overline{) 9819} \\
 \underline{-9} \\
 08 \\
 \underline{-0} \\
 81 \\
 \underline{-81} \\
 009 \\
 \underline{-9} \\
 0
 \end{array}$$

$$\begin{array}{r}
 \text{1089} \\
 8 \overline{) 8712} \\
 \underline{-8} \\
 07 \\
 \underline{-0} \\
 71 \\
 \underline{-64} \\
 072 \\
 \underline{-72} \\
 0
 \end{array}$$

d) Synthesis/summarization

Guide pupils to summarize how to divide a 4-digit number by one digit. Insist on the use of the standard written method.

e) Assessment

- Provide activities to be done by pupils (the **application activity 3.15**) and check their answers.
- Assign homework to all pupils.

f) Answer for activities

Activity 3.15.1

$$1) 7\ 496 \div 8 = 937 \quad 2) 6\ 327 \div 9 = 903 \quad 3) 7\ 049 \div 7 = 1\ 007$$

Activity 3.15.2

$$\begin{array}{lll} a) 8\ 984 \div 8 = 1\ 123 & d) 8\ 172 \div 9 = 908 & f) 8\ 491 \div 7 = 1\ 213 \\ b) 6\ 576 \div 4 = 1\ 644 & e) 7\ 985 \div 5 = 1\ 597 & g) 9\ 879 \div 3 = 3\ 293 \\ c) 8\ 952 \div 6 = 1\ 492. & & \end{array}$$

Answers for application activity 3.15

$$\begin{array}{lll} a) 9\ 549 \div 9 = 1\ 061. & c) 7\ 952 \div 7 = 1\ 136. & e) 6\ 585 \div 5 = 1\ 317. \\ b) 8\ 728 \div 8 = 1\ 091. & d) 6\ 906 \div 6 = 1\ 151. & f) 8\ 976 \div 4 = 2\ 244. \end{array}$$

Note:

Through the use of the **activity 3.16.1** and **3.16.2**, word problems can be taught in another lesson.

Answers for activity 3.16.1

- 1) The number of cows to be received by each district = $9\ 891 \div 7 = 1\ 413$
- 2) The number of voting cards to be received by each center = $7\ 992 \div 8 = 999$
- 3) The number of notebooks to be contained by each box = $5\ 490 \div 9 = 610$
- 4) The number of bricks to be used for each house = $9\ 896 \div 4 = 2474$.

Answers for activity 3.16.2

- 1) The number of students received by each school = $7\ 895 \div 5 = 1\ 579$
- 2) The number of laptops to be distributed to each district = $6\ 797 \div 7 = 971$.

Answers for application activity 3.16

- 1) Number of planted trees per day = $8\ 750 \div 5 = 170$ trees
- 2) Equally share 9 400 fruit seedlings to 4 cells. Number fruit seedlings each cell receives = $9\ 400 \div 4 = 235$ fruit seedlings.

3.6 Summary of the unit

Try to summarize the content for this unit.

3.7 Additional information for the teacher

- The teacher plays an important role in the learning activity, guide all learning situations and engage every pupil;
- Explain clearly how to complete numbers in a table of place values, how to compare numbers, how to arrange them and how to partition a number into thousand, hundreds, tens and ones.
- Guide them to be able to perform addition, subtraction, multiplication and division of numbers;
- Use the standard written method to simplify how to multiply a number by a two digit number;
- Use word problems from the pupils' real life experience to address crosscutting issues during lessons where applicable;
- Try to use your creativity and innovation to apply the competence based approaches of teaching to cater all learning styles for your pupils.

3.8 Answers for the end unit assessment 3

- 1) a) Nine thousand ix hundred seventy eight
b) 7 995
- 2) a) 7 698 b) 8 345
- 3) 5 968
- 4) a) thousands b) Ones c) Hundreds d) Tens
- 5) a) $8\ 189 < 8\ 819$ c) $7\ 689 = 7\ 689$
b) $6\ 583 > 6\ 538$ d) $9\ 587 > 9\ 578$
- 6) 4 784; 5 746; 6 479; 7 356; 7 365; 8 497.
- 7) 9 786; 8 710; 6 827; 6 718; 5 708; 4 738.
- 8) a) $6\ 574 + 2\ 695 = 9269$ b) $7\ 865 + 1\ 879 = 9\ 744$
c) $5\ 679 + 4320 = 9999$ d) $6\ 958 + 2\ 794 = 9\ 752$
- 9) a) $7\ 856 - 5976 = 1880$ b) $8\ 761 - 6\ 819 = 1\ 942$
c) $9\ 852 - 8974 = 878$ d) $6\ 265 - 5\ 987 = 278$.

10)a) 198	b) 265	c) 349	d) 573	e) 497
$\begin{array}{r} \times 49 \\ \hline 9\ 702 \end{array}$	$\begin{array}{r} \times 37 \\ \hline 9\ 805 \end{array}$	$\begin{array}{r} \times 28 \\ \hline 9\ 772 \end{array}$	$\begin{array}{r} \times 16 \\ \hline 9\ 168 \end{array}$	$\begin{array}{r} \times 17 \\ \hline 8\ 449 \end{array}$

11) a) $7\ 985 \div 5 = 1\ 597$

b) $8\ 526 \div 6 = 1\ 421$

12) The number of remained sacks: $8\ 759 - 5\ 784 = 2\ 975$

13) The number of the remaining books: $9\ 68 - 378 = 590$

14) The number of Lorries: $300 \times 24 = 7\ 200$

15) The number of mangoes to be in each basket: $981 \div 9 = 109$.

Note:

As a teacher, after this assessment, you have to provide remedial activities, consolidation and extension activities.

UNIT 4

FRACTIONS HAVING A DENOMINATOR NOT GREATER THAN 10

4.1. Key unit competence

Working out mathematical exercises in relation with reading, writing, drawing, adding and subtracting fractions with the same denominator less than or equal to 10 and multiplying fractions with a number.

4.2. Prerequisite

Pupils will easily learn this unit, if they have a good background on the following:

Reading, writing and illustrating $\frac{1}{2}$, $\frac{1}{4}$ and $\frac{1}{8}$.

4.3. Cross-cutting issues to be addressed

- **Gender balance:** provide equal opportunity to boys and girls in the lesson
- **Inclusive education:** promote education for all learners in the teaching and learning activities.
- **Environment and sustainability:** This will be addressed when pupils will be maintaining hygiene for their classroom and for materials they used.
- **Financial education:** addressed when pupils discuss word problem involving how to use a fraction of money and save another quantity.
- **Peace and values education:** addressed when pupils are encouraged to work collaboratively and peacefully in their group.

4.4. Sub-headings /List of lessons

UNIT 4: FRACTIONS HAVING A DENOMINATOR NOT GREATER THAN 10 (16 periods)			Reinforcement and Extension	
	Lesson title	Learning objectives	Number of periods	
1	Introductory activity	Arouse the curiosity of learners on the importance of reading and writing fractions.	1	
2	Reading and writing fractions with a denominator less than or equal to 10	Read and write fractions with a denominator less than or equal to 10.	1	
3	Shading and illustrating fractions	Shade colors and illustrate fractions	1	
4	Comparing like fractions with a denominator less than or equal to 10	Compare like fractions with a denominator less than or equal to 10.	1	1
5	Addition of fractions with denominators less than or equal to 10	Add fractions with denominators less than or equal to 10.	1	1
6	Remediation	Provide learning support to learners who are falling behind their peers	1	
7	Subtraction of like fractions having denominators less than or equal to 10	Subtract like fractions having denominators less than or equal to 10.	1	1

8	Finding the complement of a fraction for forming a unit fraction	Find the complement of a fraction for forming a unit fraction.	1	
9	Fraction of a number for real objects	Find a fraction of a number for real objects and a fraction of a number.	1	1
10	Word problems involving fraction of a number	Solve word problems involving fraction of a number.	1	
11	End unit assessment	Work out mathematical exercises in relation with reading, writing, drawing, adding and subtracting like fractions with the denominator less than or equal to 10 and multiplying fractions with a number.	1	
12	Remediation	Provide learning support to learners who are falling behind their peers	1	
	Total		12	4

4.5 Teaching and learning activities

Lesson 1: Guidance on introductory activity 4

- Invite pupils to read the story of Mugiraneza who does not know how to share school materials to his children depending on what they need.
- Guide pupils to discuss the reason one can fail to count objects which form a part of a ;
- Ask them to suggest what is required for every one of them to be able to determine some quantities related to a fraction of a ;
- Move around in the class to get aware of different suggestions and ask some probing questions where necessary.

- Invite all pupils to a class discussion and basing on their experience, prior knowledge and abilities shown in answering questions for this activity, open a discussion with probing questions to guide them to give their predictions and ensure that you arouse their curiosity on what is going to be learnt in this unit so that they may be able to manage different quantities of their properties

Lesson 2: Reading and writing fractions with a denominator less than or equal to 10

a) Objectives

Read and write fractions with a denominator less than or equal to 10.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:


- Plan how to help pupils with different impairments;
- Prepare sufficient learning materials to be cut up into portions whose denominator is less than or equal to 10.
- Guide pupils to: Work out different activities for reading and writing fractions not exceeding a whose denominator is less than 10.




c) Teaching resources and learning resources

- Different objects to be cut: sugarcane, oranges, sticks, soap, sheets of paper, etc.
- Safe materials to be used: scissors or plastic knife to cut a into portions of equal sizes;
- Semi concrete objects: drawings illustrating different fractions, rectangles, squares, circles, etc.

d) Teaching and learning activities:

- invite pupils to observe learning materials and explain instructions on activities to be done (use activity 4.1.1 and activity 4.1.2):

Representation	Fraction	Names
 <p>A whole orange</p>	<p>1</p>	<p>A whole</p>

	$\frac{1}{2}$	A half
	$\frac{1}{3}$	A third
	$\frac{1}{4}$	A quarter

- Guide them to discover how to read a fraction on semi concrete objects or from a concrete object cut into equal portions;
- Form groups of pupils and provide them with fraction cards and ask them to: read a fraction on the card, write the fraction in words;
- Put fraction cards in a box and ask each learner to pick a card and try to read and write in words the fraction found.
- Assign pupils to do activity 4.1.3, move around and give facilitation when necessary;
- Ask pupils for each group to discuss the findings for its members;
- Ask some groups to present the findings and guide the class to harmonize how to read fractions.

e) Synthesis/summarization

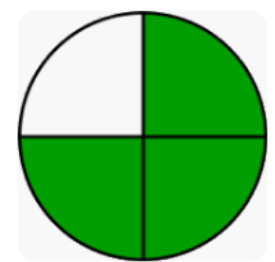
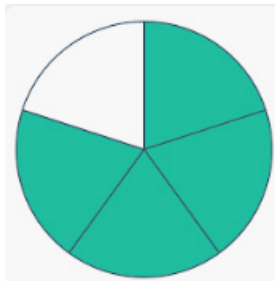
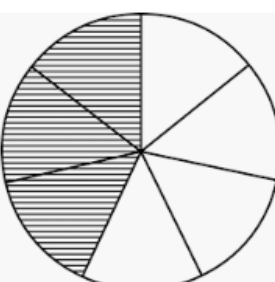
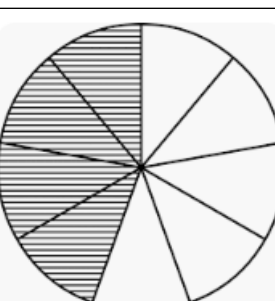
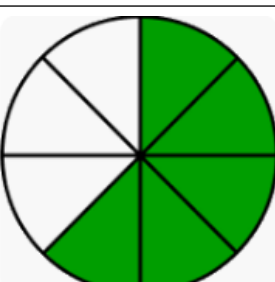
Guide pupils to summarize how to read and write a fraction and how to name the terms of a fraction.

f) Assessment

Provide activities to pupils from the pupil's book **(Use application activity 4.1)**.

g) Answer for activities

Activity 4.2

	$\frac{3}{4}$	Three quarters
	$\frac{4}{5}$	Four fifths
	$\frac{3}{7}$	Three sevenths
	$\frac{4}{9}$	Four ninths
	$\frac{5}{8}$	Five eighths

Activity 4.1.4

a) $\frac{1}{2}$ b) $\frac{2}{8}$ c) $\frac{2}{4}$

Application activity 4.1

1) a) $\frac{2}{10}$ b) $\frac{4}{10}$ c) $\frac{1}{10}$ d) $\frac{3}{10}$
 2) a) $\frac{3}{9}$ c) $\frac{1}{9}$ e) $\frac{4}{9}$ g) $\frac{3}{9}$ i) $\frac{5}{9}$
 b) $\frac{6}{9}$ d) $\frac{2}{9}$ f) $\frac{2}{9}$ h) $\frac{2}{9}$

Lesson 3: Shading and illustrating fractions not exceeding a**a) Objectives**

Shade and illustrate fractions not exceeding a .


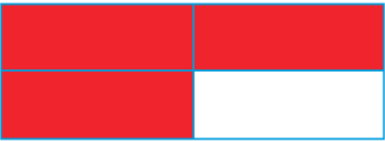
b) Teaching resources and learning resources

- Different objects to be cut: sugarcane, oranges, sticks, soap, sheets of paper, etc.
- Safe materials to be used: scissors or plastic knife to cut a into portions of equal size;
- Semi concrete objects: drawings illustrating different fractions, rectangles, squares, circles, etc.

c) Teaching and learning activities:

- Invite pupils to observe the shaded parts of objects. Ask them to say and write the related fractions in figures

Example:

	Picture	Fraction of shaded part	Fraction of unshaded part
a)		—	—
b)		—	—

- Organize groups of pupils and give them activities to do (for example **activity**

4.2.1 and Activity 4.2.2).

- Move around in the class and provide probing questions for assistance where necessary;
- Guide pupils on how to shade a portion representing a fraction (use for example **activity 4.2.3**);
- Invite some groups to present and guide the class to harmonize on how to shade or how to illustrate a fraction.

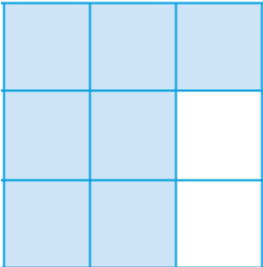
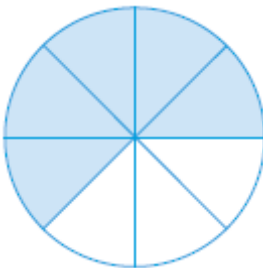

d) Synthesis/summarization

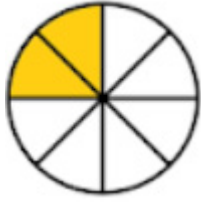
Guide pupils to summarize how to shade or how to illustrate a fraction.

e) Assessment

- Provide activities to be done by pupils (see **application activity 4.2**) and check their answers.
- Assign all pupils a homework.

f) Answer for activities

Picture	Fraction of shaded part	Fraction of unshaded part
	$\frac{7}{9}$	$\frac{2}{9}$
	$\frac{6}{9}$	$\frac{3}{9}$
	$\frac{3}{4}$	$\frac{1}{4}$



$$\frac{2}{8}$$

$$\frac{4}{8}$$

Application activity 4.2

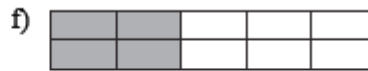
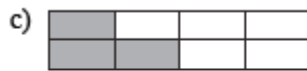


$\frac{4}{5}$: four fith or four out of five

$\frac{7}{9}$: seven ninth or seven out of nine.

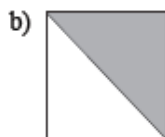
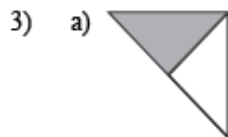
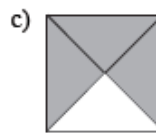
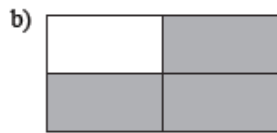
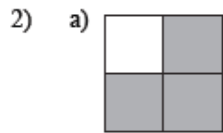


$\frac{2}{3}$: two over three or two out of 3 or two third $\frac{6}{7}$: six seventh or six over seven



$\frac{3}{8}$:

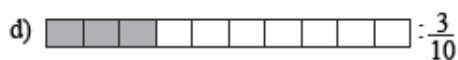
$\frac{4}{10}$:



4) a) $\frac{1}{2}$:

b) $\frac{3}{8}$:

c) $\frac{4}{4}$



Lesson 4: Comparing like fractions with a denominator less than or equal to 10

a) Objectives

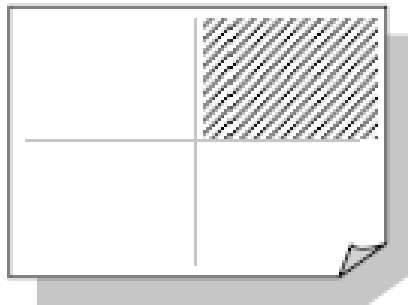
Compare like fractions with a denominator less than or equal to 10.

b) Teaching resources and learning resources

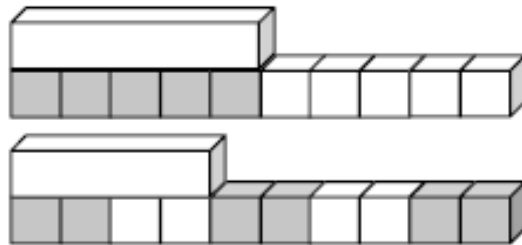
- Different objects to be cut: sugarcane, oranges, sticks, soap, sheets of paper, etc.
- Safe materials to be used: scissors or plastic knife to cut into portions of equal sizes;
- Semi concrete objects: drawings illustrating different fractions, rectangles, squares, circles, etc.

c) Teaching and learning activities:

- Invite one pupil and guide him/her on how to partition concrete objects or manipulative materials into equal parts and compare parts to the whole to introduce proper fractions, for example to partition paper equally by folding:

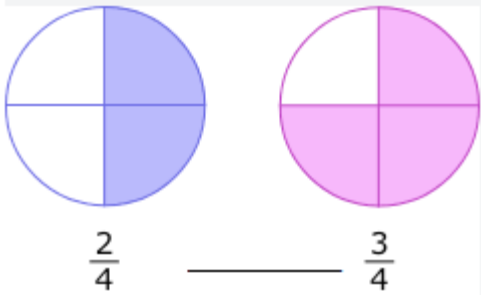


You can use also base ten blocks or equal parts of an orange



- Ask other pupils to say the fraction of the shaded part and the fraction for the unshaded parts and ask them to compare fractions they find. Use guiding learning **Activity 4.3.1**.

Where pupils will observe the shaded parts and complete by: **greater than** or **less than**

 <p style="text-align: center;">$\frac{2}{4}$ _____ $\frac{3}{4}$</p>	<p>$\frac{2}{4}$ is _____ $\frac{3}{4}$</p>
<p>The blue part is smaller than the pink part</p>	

- Show other values of two proper fractions with fraction strips and Cuisenaire rods and ask pupils to compare fractions using $<$, $>$ or $=$.
- Organize groups of pupils and give them activities to do (for example **Activity 4.3.2**), you can give them fraction cards and ask pupils to compare pairs of those fractions using cards with comparison symbols ($<$, $>$ or $=$)
- Move around in the class and provide probing questions for assistance where necessary;
- Invite some groups to present and guide the class to harmonize on how to compare fractions of a same denominator up to 10.
- Assign the same group **activity 4.3.3** and check how pupils are performing.

d) Synthesis/summarization

- Guide pupils to summarize how to compare fractions of a same denominator up to 10.
- Emphasize fraction as: *equal size portions or equal shares of a set.*

e) Assessment

- Provide activities to be done by pupils and check their answers;
- Assign all pupils the **application activity 4.3** as homework.

f) Answer for activities

Activity 4.3.1

$\frac{2}{4}$ is **less than** $\frac{3}{4}$ $\frac{6}{8}$ greater than $\frac{5}{8}$

Acity 4.3.3

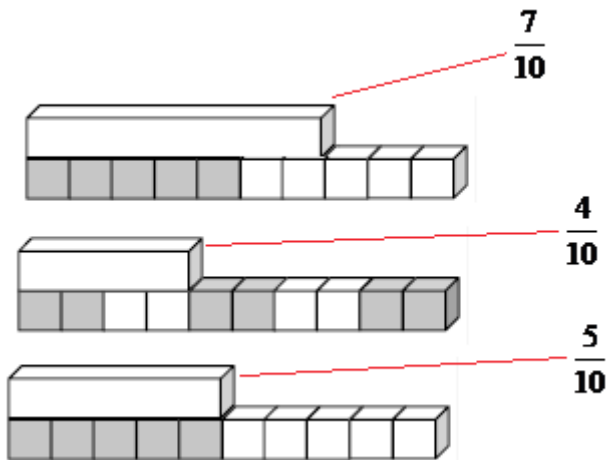
a) $\frac{3}{8} > \frac{1}{8}$ c) $\frac{1}{2} = \frac{1}{2}$ e) $\frac{4}{6} < \frac{5}{6}$
b) $\frac{5}{9} > \frac{2}{9}$ d) $\frac{5}{5} = \frac{5}{5}$ f) $\frac{1}{4} < \frac{4}{4}$

Application activity 4.3

a) $\frac{1}{3} < \frac{2}{3}$ d) $\frac{2}{5} < \frac{3}{5}$ g) $\frac{1}{6} < \frac{4}{6}$
b) $\frac{1}{4} < \frac{3}{4}$ e) $\frac{4}{7} > \frac{1}{7}$ h) $\frac{4}{10} < \frac{7}{10}$
c) $\frac{4}{5} > \frac{2}{5}$ f) $\frac{5}{6} = \frac{5}{6}$ i) $\frac{7}{9} < \frac{8}{9}$

Note:

After this lesson, organize another **lesson for arranging fractions of a same denominator** not exceeding 10 in a given order. You can start by a concrete object such as a sugarcane can be divided in different parts and ask pupils to arrange them starting by the smallest towards the biggest or vice versa. To compare this fractions: $\frac{5}{10}$ $\frac{7}{10}$ $\frac{4}{10}$, use a drawing such as the following:



then ask pupils to arrange them before assigning to them to do the **activity 4.4.1**, **activity 4.4.2** and **activity 4.4.3**.

Activity 4.4.3

a) $\frac{1}{10}, \frac{2}{10}, \frac{3}{10}, \frac{5}{10}, \frac{6}{10}$ b) $\frac{1}{9}, \frac{2}{9}, \frac{4}{9}, \frac{5}{9}, \frac{6}{9}$ c) $\frac{4}{10}, \frac{7}{10}, \frac{8}{10}, \frac{9}{10}, \frac{10}{10}$ d) $\frac{1}{8}, \frac{2}{8}, \frac{3}{8}, \frac{5}{8}, \frac{6}{8}$

Activity 4.4.5

a) $\frac{6}{6}, \frac{5}{6}, \frac{4}{6}, \frac{3}{6}, \frac{2}{6}, \frac{1}{6}$ b) $\frac{5}{5}, \frac{4}{5}, \frac{3}{5}, \frac{2}{5}, \frac{1}{5}$

c) $\frac{4}{4}, \frac{3}{4}, \frac{2}{4}, \frac{1}{4}$ d) $\frac{3}{3}, \frac{2}{3}, \frac{1}{3}$

Application activity 4.4

1) a) $\frac{2}{7}, \frac{3}{7}, \frac{4}{7}, \frac{6}{7}, \frac{7}{7}$ b) $\frac{10}{10}, \frac{2}{10}, \frac{8}{10}, \frac{6}{10}, \frac{9}{10}$

c) $\frac{2}{7}, \frac{3}{7}, \frac{4}{7}, \frac{6}{7}, \frac{7}{7}$ d) $\frac{1}{5}, \frac{2}{5}, \frac{3}{5}, \frac{4}{5}, \frac{5}{5}$

2) a) $\frac{7}{8}, \frac{6}{8}, \frac{4}{8}, \frac{3}{8}, \frac{2}{8}$ b) $\frac{6}{6}, \frac{5}{6}, \frac{4}{6}, \frac{2}{6}, \frac{1}{6}$

c) $\frac{4}{4}, \frac{3}{4}, \frac{2}{4}, \frac{1}{4}$ d) $\frac{3}{3}, \frac{2}{3}, \frac{1}{3}$

Lesson 5: Addition of -fractions with the same denominators less than or equal to 10**a) Objectives**

Add fractions with denominators less than or equal to 10

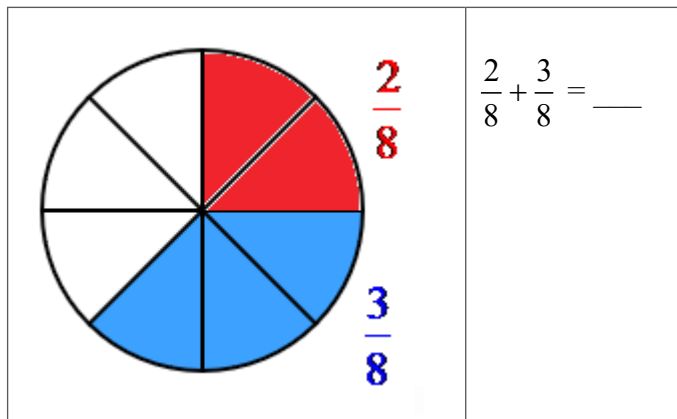
b) Teaching resources and learning resources

- Different objects to be cut: sugarcane sugarcane, oranges, sticks, soap, sheets of paper, etc.
- Safe materials to be used: scissors or plastic knife to cut into portions of equal sizes;
- Semi concrete objects: drawings illustrating different fractions, rectangles, squares, circles, etc.

c) Teaching and learning activities:

- Invite one pupil and guide him/her on how to demonstrate addition of proper fractions through paper folding activity or use fraction charts, diagrams and number lines;
- Ask other pupils to say the fraction of the part obtained when those portions are put together;

For **example**, the part shaded in red color and the part shaded in blue color can make on fraction. What fraction do they make altogether?



- Show other values of two proper fractions with fraction strips and Cuisenaire rods and ask pupils to put them together and say the fraction obtained;
- Organize groups of pupils and give them activities to do (for example **Activity 4.5.1**), you can also give them fraction cards and ask pupils to add those fractions using cards with addition symbol (+) and equality symbol (=).
- Move around in the class and provide probing questions for assistance where necessary;
- Assign the same group **activity 4.5.2**, and check how they are performing.
- Invite some groups to present their findings and guide the class to harmonize on how to add fractions of a same denominator which is less or equal to 10.

Note:

Concerning **the lesson on word problems involving addition of fractions**, help pupils to solve a one –step or a two-step problem:

- guide them to *understand the problem*,
- *identify facts (given and requested)*,
- *draw visual representations and solve the problem using the addition.*

Start by guiding pupils to solve some problems in groups or in a class discussion (use **activity 4.5.4**), provide problems to be solved into groups or in pair and then give problems to be solved individually (**application activity 4.5**).

d) Synthesis/summarization

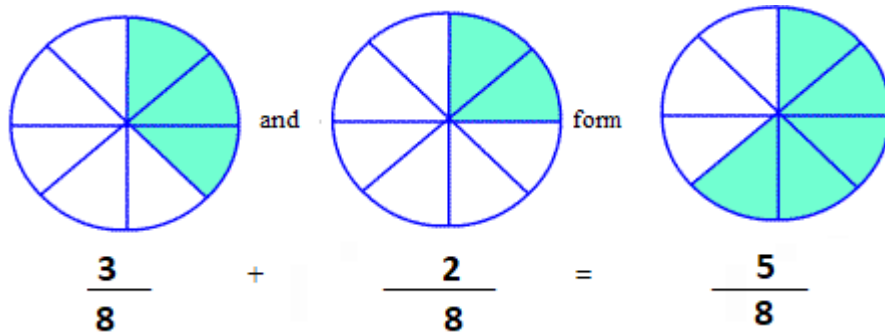
- Guide pupils to summarize how to add fractions of a same denominator which is less or equal to 10: **add their numerators and copy the denominator.**

e) Assessment

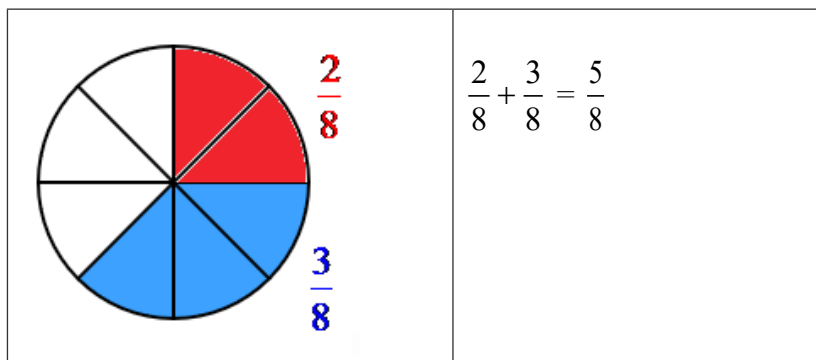
- Provide activities to be done by pupils (**activity 4.5.3** or **application activity 4.5**) and check their answers.
- Assign homework to all pupils.

f) Answer for activities

Answers for activity 4.5.1



Activity 4.5.2



Activity 4.5.3

- a) $\frac{4}{8}$ b) $\frac{9}{9}$ c) $\frac{5}{7}$ d) $\frac{3}{4}$ e) $\frac{4}{8}$ f) $\frac{9}{10}$

Activity 4.5.4

- 1) Fraction of notebooks she did: $\frac{3}{5} + \frac{1}{5} = \frac{4}{5}$
- 2) Fraction of milking cows he had altogether: $\frac{3}{10} + \frac{6}{10} = \frac{9}{10}$
- 3) Fraction of the sugar he sold: $\frac{2}{7} + \frac{4}{7} = \frac{6}{7}$

Application activity 4.5

- 1) a) $\frac{7}{8}$ b) $\frac{8}{10}$ c) $\frac{9}{9}$ d) $\frac{6}{7}$

- 2) Fraction of a bread they eat altogether: $\frac{5}{10} + \frac{3}{10} = \frac{8}{10}$

- 3) Fraction of prepared garden: $\frac{4}{9} + \frac{2}{9} = \frac{6}{9}$

- 4) Fraction of the journey he covered: $\frac{3}{8} + \frac{4}{8} = \frac{7}{8}$

Lesson 6: Subtraction of fractions having denominators less than or equal to 10

a) Objectives

Subtract of fractions having denominators less than or equal to 10

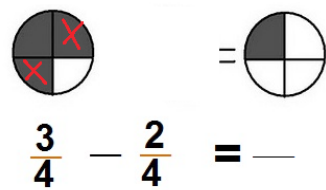
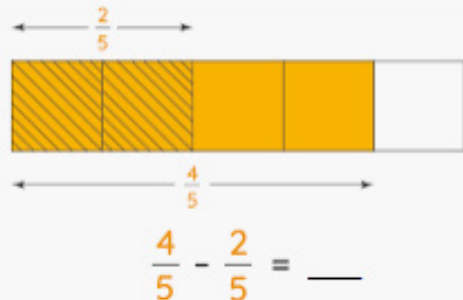
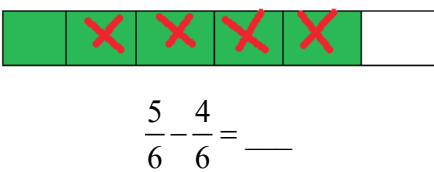
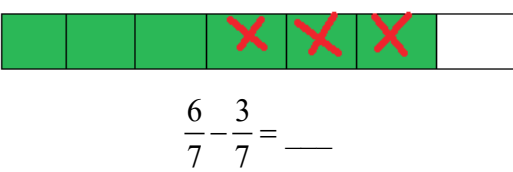
b) Teaching resources and learning resources

- Different objects to be cut: sugarcane , oranges, sticks, soap, sheets of paper, etc.
- Safe materials to be used: scissors or plastic knife to cut into portions of equal sizes;
- Semi concrete objects: drawings illustrating different fractions, rectangles, squares, circles, etc.

c) Teaching and learning activities:

- Invite one pupil and guide him/her on how to demonstrate the subtraction of proper fractions through paper folding activity or use fraction charts, diagrams and number lines;

- Ask other pupils to say the fraction of the part remained when one portion is put away;
- Show other values of proper fractions with fraction strips and base ten rods and ask pupils to cut one portion and put it away and say the fraction of the remained portion;
- After using the concrete objects, use for example the following illustration and ask pupils to say and write the fraction of remained part.

- Organize groups of pupils and give them activities to do (for example **Activity 4.7.1** or **activity 4.7.2**), you can also give them fraction cards and ask pupils to form differences of those fractions using cards with subtraction symbol (-) and equality symbol (=).
- Move around in the class and provide probing questions for assistance where necessary;
- Invite some groups to present and guide the class to harmonize on how to carry out the subtraction of fractions with a same denominator which is less or equal to 10.
- Motivate pupils to work in pair and do **activity 4.7.3** then check how they are performing.

d) Synthesis/summarization

- Guide pupils to summarize how to subtract fractions of a same denominator which is less or equal to 10: **subtract their numerators and copy the denominator.**

Note:

Concerning **the lesson on word problems involving subtraction of fractions**, help pupils to solve a one –step or a two-step problem:

- guide them to *understand the problem*,
- *identify facts (given and requested)*,
- *draw visual representations and solve the problem using the addition.*
- Start by guiding pupils to solve some problems in groups or in a class discussion (use **activity 4.7.4**), provide problems to be solved into groups or in pairs **and** then give problems to be solved individually (**application activity 4.8**).

e) Assessment

- Provide activities to be done by pupils (**application 4.7**) and check their answers.
- Assign homework to all pupils.

f) Answer for activities**Activity 4.7.3**

$$\begin{array}{lll} \text{a) } \frac{7}{9} - \frac{4}{9} = \frac{3}{9} & \text{c) } \frac{5}{6} - \frac{4}{6} = \frac{1}{6} & \text{e) } \frac{4}{5} - \frac{2}{5} = \frac{2}{5} \\ \text{b) } \frac{8}{9} - \frac{7}{9} = \frac{1}{9} & \text{d) } \frac{5}{8} - \frac{4}{8} = \frac{1}{8} & \text{f) } \frac{10}{10} - \frac{8}{10} = \frac{2}{10} \end{array}$$

Answers for activity 4.7.4

$$1) \frac{6}{10} \qquad 2) \frac{4}{9} \qquad 3) \frac{6}{10}$$

Application activity 4.7

$$\begin{array}{ll} 1) \text{ a) } \frac{9}{10} - \frac{4}{10} - \frac{3}{10} = \frac{2}{10} & \text{b) } \frac{8}{8} - \frac{1}{8} - \frac{6}{8} = \frac{1}{8} \\ \text{c) } \frac{7}{9} - \frac{2}{9} - \frac{3}{9} = \frac{2}{9} & \text{d) } \frac{6}{7} - \frac{3}{7} - \frac{2}{7} = \frac{1}{7} \end{array}$$

$$2) \text{ The fraction of remaining: } \frac{6}{7} - \frac{3}{7} = \frac{3}{7}$$

$$3) \text{ Fraction of clothes not dried up: } \frac{7}{8} - \frac{5}{8} = \frac{2}{8}$$

Lesson 8: Finding the complement of a fraction for forming a unit fraction

a) Objectives

Find the complement of a fraction for forming a unit fraction.

b) Teaching resources and learning resources




- Different objects to be cut: sugarcane, oranges, sticks, soap, sheets of paper, etc.
- Safe materials to be used: scissors or plastic knife to cut into portions of equal sizes;
- Semi concrete objects: drawings illustrating different fractions, rectangles, squares, circles, etc.

c) Teaching and learning activities:

- Invite one pupil and guide him/her on how to demonstrate what remains when you cut one portion from a whole whose number of portions is known.



- Ask other pupils to say the fraction of the part remained when one portion is put away;

Given fraction	Complement	The whole
 $\frac{3}{4}$	 $\frac{1}{4}$	 $\frac{4}{4} = 1$

- Organize groups of pupils and give them activities to do (for example **Activity 4.9.1**) and **activity 4.9.2**, you can also give them fraction cards and ask pupils to take each card and find the card which has its complement fraction.
- Guide pupils to work in pair and do **activity 4.9.3**
- Move around in the class and provide probing questions for assistance where necessary;

- Invite some groups to present and guide the class to harmonize on how to find a complement of a fraction: . One whole number take away the given fraction.

d) Synthesis/summarization

Guide pupils to summarize how to find the complement of a fraction: **the fraction which makes a – the given fraction.**

Example: the complement of $\frac{3}{4}$ is $\frac{4}{4} - \frac{3}{4} = \frac{4-3}{4} = \frac{1}{4}$.

e) Assessment

- Provide activities to be done by pupils (**activity 4.9**) and check their answers.
- Assign homework to all pupils.

f) Answer for activities

Activity 4.9.3

- a) $\frac{3}{7}$ b) $\frac{3}{9}$ c) $\frac{2}{5}$ d) $\frac{3}{8}$ e) $\frac{4}{6}$ f) $\frac{2}{5}$
 g) $\frac{5}{6}$ h) $\frac{1}{5}$ i) $\frac{8}{10}$ j) $\frac{1}{3}$ k) $\frac{3}{10}$ l) $\frac{2}{9}$

Application activity 4.9

- a) $\frac{4}{7}$ b) $\frac{5}{9}$ c) $\frac{2}{8}$ d) $\frac{9}{10}$

Lesson 9: Fraction of a number for real objects

a) Objectives

Find a fraction of a number for real objects and a fraction of a number.

b) Teaching resources and learning resources

- Different objects to be cut: sugarcane , oranges, sticks, soap, sheets of paper, etc.
- Safe materials to be used: scissors or plastic knife to cut into portions of equal sizes;
- Semi concrete objects: drawings illustrating different fractions, rectangles, squares, circles, etc.

c) Teaching and learning activities:

- Invite one pupil and guide him/her on how to demonstrate a fraction of a given number of objects: to count objects, divide them in a number of groups equal to the denominator and then combine the number of groups which is equal to the numerator of a given fraction;
- Ask other pupils to say the total number of objects found in the new combination (group) of objects. For example: How many rods do we have? Find the half of them



- Considering that pupils can have a misconception, guide them with clear explanations. **Example:**

Total number of objects	Fraction of a number of objects and explanation
	$\frac{1}{2}$ of 10 oranges: 5 oranges. <i>I put all oranges in 2 groups and I count oranges for 1 group.</i>
	$\frac{5}{6}$ of these 12 tomatoes: ----- <i>I put all tomatoes in 6 groups and count tomatoes for 5 groups.</i>
	$\frac{3}{7}$ of these 14 apples: ----- <i>I put all apples in 7 groups and I count apples for 3 groups.</i>

- Organize groups of pupils and give them activities to do (for example **Activity 4.10.1-3**); You can also give them a fraction card and a number card and ask pupils to find the a number card which has the corresponding fraction.
- Move around in the classroom and provide probing questions for assistance where necessary;
- Invite some groups to present and guide the class to harmonize on how to find a fraction of a number.

d) Synthesis/summarization

Guide pupils to summarize how to find a fraction of a number:

(Take the number and multiply it by the numerator of a fraction): the denominator.

Example: $\frac{3}{4}$ of 20 is $\frac{3}{4}(20) = \frac{3 \times 20}{4} = \frac{60}{4} = 15$.

e) Assessment

- Provide activities to be done by pupils (**application activity 4.10**) and check their answers.
- Assign homework to all pupils.

f) Answer for activities

Activity 4.10.1

a) $\frac{1}{2}$ of 10: $\frac{10 \times 1}{2} = 5$

d) $\frac{7}{8}$ of 16: $\frac{16 \times 7}{8} = 14$

b) $\frac{5}{6}$ of 12: $\frac{12 \times 5}{6} = 10$

e) $\frac{5}{9}$ of 9: $\frac{9 \times 5}{9} = 5$

c) $\frac{3}{7}$ of 14: $\frac{14 \times 3}{7} = 6$

f) $\frac{7}{10}$ of 10: $\frac{7 \times 10}{10} = 7$

Activity 4.10.2

a) $\frac{2}{3}$ bya 45: $\frac{45 \times 2}{3} = 30$

d) $\frac{5}{8}$ bya 40: $\frac{40 \times 5}{8} = 25$

b) $\frac{4}{5}$ bya 15: $\frac{15 \times 4}{5} = 12$

e) $\frac{3}{10}$ bya 70: $\frac{70 \times 3}{10} = 21$

c) $\frac{3}{7}$ bya 14: $\frac{14 \times 3}{7} = 6$

f) $\frac{4}{7}$ bya 35: $\frac{35 \times 4}{7} = 20$

Application activity 4.10

1. a) $\frac{1}{8}$ of 64: $\frac{64 \times 1}{8} = 8$

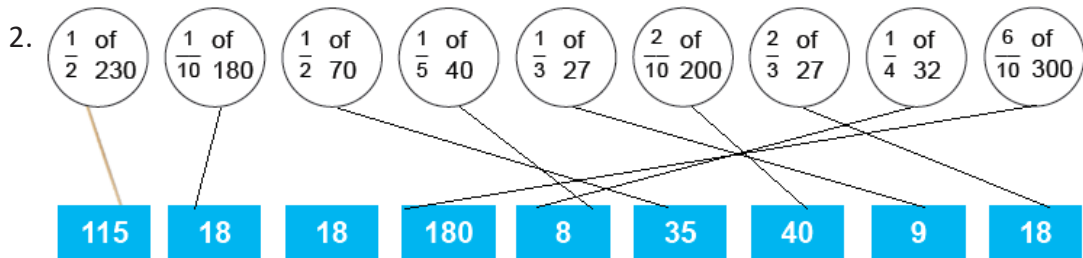
d) $\frac{1}{10}$ of 100: $\frac{100 \times 1}{10} = 10$

b) $\frac{5}{9}$ of 54: $\frac{54 \times 5}{9} = 30$

e) $\frac{9}{10}$ of 30: $\frac{30 \times 9}{10} = 27$

c) $\frac{7}{10}$ of 50: $\frac{50 \times 7}{10} = 35$

f) $\frac{7}{8}$ of 56: $\frac{56 \times 7}{8} = 49$



Lesson 10: Word problems involving fractions

a) Objectives

Solve word problems involving fractions with same denominators .

b) Teaching resources and learning resources

- Different objects to be cut: sugarcane, oranges, sticks, soap, sheets of paper, etc.
- Safe materials to be used: scissors, or plastic knife to cut an object into portions of equal sizes;
- Semi concrete objects: drawings illustrating different fractions, rectangles, squares, circles, etc.

c) Teaching and learning activities:

- Invite one pupil and guide him/her on how to solve a problem involving a fraction of a given number of objects: to count objects, divide them in a number of groups equal to the denominator, and then combine the number of groups which is equal to the numerator of a given fraction;
- Ask other pupils to say the total number of objects found in the new combination (group) of objects.
- Organize groups of pupils and give them activities to do (for example **Activity 4.11.1** and **activity 4.11.2**);
- Move around in the classroom and provide probing questions for assistance where necessary;
- Invite some groups to present and guide the class to harmonize on how to solve a problem.

d) Synthesis/summarization

Guide pupils to summarize how to solve a problem:

- guide them to *understand the problem*,
- *identify facts (given and requested)*,

- draw visual representations and
- solve the problem using the addition.

e) Assessment

- Provide activities to be done by pupils (**application activity 4.11**) and check their answers.
- Assign homework to all pupils.

f) Answer for activities

Activity 4.11.2

Number of flowered and young bananas: $\frac{4}{5}$ of 200: $\frac{200 \times 4}{5} = 160$

Number of sacks of cement remained in the store: $\frac{5}{8}$ of 120: $\frac{120 \times 5}{8} = 75$

The number of participants who came with laptops: $\frac{2}{5}$ of 125: $\frac{125 \times 2}{5} = 50$

Application activity 4.11

1. Number of that operate in the provinces: $\frac{4}{7}$ of 84 = $\frac{84 \times 4}{7} = 48$

2. The number of houses which have the roofs of iron sheets: $\frac{5}{6}$ of 240 = $\frac{240 \times 5}{6} = 200$

The number of houses without iron sheets $240 - 200 = 40$

3. Number of boys: $\frac{2}{3}$ of 45 = $\frac{45 \times 2}{3} = 30$

Number of girls: $45 - 30 = 15$

Note:

Concerning the lesson on the importance of fractions, the teacher will allow pupils to discuss the importance of fraction basing on their dairy experiences.

Use **activity 4.12.1**, **activity 4.12.2** and **activity 4.12.3** and ask questions:

How can you share objects?

Is it better to get equal shares?

Do you prefer to have more than others?

If you buy a sugarcane at home, what fraction can the following people take? The father, the mother, your sister or your brother and you.

4.6. Summary of the unit

Try to summarize the content for this unit.

4.7. Additional information for the teacher

- The teacher plays an important role in the learning activity, guide all learning situations and engage every pupil;
- Introduces the concept of fractions using concrete objects and manipulative materials;
- Teach pupils different ways of reading fractions, for example the fraction $\frac{1}{5}$ is “one out of five or a fifths” or “one fifth” ;
- Relate fractions to quantities such as length and mass;
- Invite pupils to create stories from given number sentences involving fractions.
- Pose to pupils, daily problems in the form of words, tables and pictorials.

4.8. Answers for the end unit assessment 4

- 1) a) $\frac{4}{6}$ b) $\frac{8}{10}$
- 4) a) $\frac{5}{7} < \frac{6}{7}$ b) $\frac{4}{6} > \frac{2}{6}$ c) $\frac{5}{9} < \frac{8}{9}$ d) $\frac{3}{4} = \frac{3}{4}$
- e) $\frac{1}{5} < \frac{3}{5}$ f) $\frac{1}{8} < \frac{8}{8}$
- 5) a) $\frac{1}{8}, \frac{2}{8}, \frac{3}{8}, \frac{4}{8}, \frac{5}{8}, \frac{6}{8}, \frac{7}{8}, \frac{8}{8}$
- b) $\frac{1}{5}, \frac{2}{5}, \frac{3}{5}, \frac{4}{5}, \frac{5}{5}$
- 6) a) $\frac{7}{7}, \frac{6}{7}, \frac{4}{7}, \frac{3}{7}, \frac{2}{7}, \frac{1}{7}$
- b) $\frac{5}{6}, \frac{4}{6}, \frac{3}{6}, \frac{2}{6}, \frac{1}{6}$
- 7) a) $\frac{3}{7}$ b) $\frac{5}{8}$ c) $\frac{4}{9}$ d) $\frac{6}{10}$
- 8) a) $\frac{3}{7} + \frac{2}{7} = \frac{5}{7}$ b) $\frac{4}{9} + \frac{2}{9} = \frac{6}{9}$ b) $\frac{2}{5} + \frac{1}{5} = \frac{3}{5}$
- 9) a) $\frac{8}{9} - \frac{5}{9} = \frac{3}{9}$ b) $\frac{9}{10} - \frac{3}{10} = \frac{6}{10}$ b) $\frac{6}{7} - \frac{4}{7} = \frac{2}{7}$

10) a) $\frac{3}{4}$ of 100: $\frac{100 \times 3}{4} = 75$ b) $\frac{7}{8}$ of 64: $\frac{64 \times 7}{8} = 56$
 c) $\frac{5}{6}$ of 60: $\frac{60 \times 5}{6} = 50$

11) She eat $\frac{3}{5}$ of the bread.

12) The fraction of water remained in the tank: $\frac{2}{7}$

13) Mutoni harvested $\frac{5}{6}$ of 360 = $(360 \times 5) : 6 = 300$

She remained with $\frac{1}{6}$ of 360 = $(360 \times 1) : 6 = 60$

15) $\frac{7}{8}$ of 960 paid the school fees = $(960 \times 7) : 8 = 840$

Others did not pay: $960 - 840 = 120$

Note: As a teacher, after this assessment, you have to provide remedial activities, consolidation and extension activities.

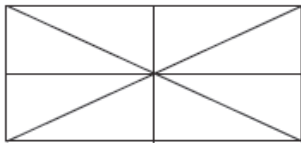
4.9. Additional activities

A) Example of remedial activities

1) Write this fraction in words:

a) $\frac{1}{4}$ b) $\frac{5}{8}$ c) $\frac{3}{4}$

2) Shade $\frac{3}{8}$ of this picture:



3) Use $>$, $<$ or $=$ to compare fractions

a) $\frac{4}{5} \square \frac{2}{5}$ b) $\frac{3}{7} \square \frac{5}{7}$ c) $\frac{2}{2} \square \frac{3}{3}$ d) $\frac{1}{8} \square \frac{3}{8}$
 e) $\frac{7}{9} \square \frac{5}{9}$ f) $\frac{3}{7} \square \frac{6}{7}$ g) $\frac{4}{5} \square \frac{3}{5}$

4) Work out

a) $\frac{3}{7} + \frac{2}{7} =$ b) $\frac{6}{10} - \frac{3}{10} =$ c) $\frac{8}{9} - \frac{5}{9} =$

d) $\frac{2}{9} + \frac{4}{9} =$ e) $\frac{2}{3}$ bya 36= $$ f) $\frac{4}{5}$ bya 45= $$

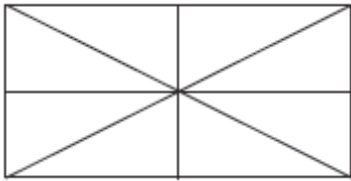
5) There are 28 books in a box. Given that $\frac{4}{7}$ of them are for Mathematics, and the remaining are English. Find the number of Mathematics books and English books.

B) Example of extension activities

1) Write this fraction in words:

a) $\frac{7}{9}$ b) $\frac{6}{7}$ c) $\frac{8}{10}$

2) Shade $\frac{7}{8}$ of this picture



3) Use $>$, $<$ or $=$ to compare fractions

a) $\frac{9}{10} \square \frac{8}{10}$ b) $\frac{8}{10} \square \frac{9}{10}$ c) $\frac{7}{7} \square \frac{10}{10}$ d) $\frac{9}{9} \square \frac{8}{9}$
e) $\frac{9}{10} \square \frac{2}{10}$ f) $\frac{6}{7} \square \frac{3}{7}$ g) $\frac{4}{5} \square \frac{3}{5}$

4) Work out

a) $\frac{1}{10} + \frac{4}{10} =$ b) $\frac{6}{7} - \frac{3}{7} =$ c) $\frac{7}{8} - \frac{4}{8} =$

d) $\frac{5}{8} + \frac{1}{8} =$ e) $\frac{4}{7}$ of 8400= $$ f) $\frac{6}{8}$ of 5600= $$

5) At a certain stadium there were 9875 spectators. Among them, $\frac{4}{5}$ were male. Find the number of female and the number of male spectators.

UNIT 5

LENGTH MEASUREMENTS

5.1. Key unit competence

Measure and show the relationship between length measurements, compare, add, subtract length measurements and multiply/ divide length measurements by a number.

5.2. Prerequisite

Pupils will easily learn this unit, if they have a good background on the length measurements learnt in P2: **m**, **dm** and **cm**.

5.3. Cross-cutting issues to be addressed

- **Gender balance:** provide equal opportunity to boys and girls in the lesson
- **Inclusive education:** promote education for all learners in the teaching and learning activities.
- **Environment and sustainability:** This will be addressed when pupils will be maintaining hygiene for their classroom and for materials they used.
- **Peace and values education:** addressed when pupils are encouraged to work collaboratively and peacefully in their group.

5.4. Sub-headings /List of lessons

UNIT 5: LENGTH MEASUREMENTS (16 Periods)			Reinforcement and Extension	
	Lesson title	Learning objectives	Number of periods	
1	Introductory activity	Arouse the curiosity of learners on the content of unit 5	1	
2	Measuring the length of objects	Measure the length of objects.	1	
3	Relationship between length measurements and their conversion	Show length measurements and their conversion.	2	1
4	Comparing length measurements	Compare length measurements.	1	1

5	Remediation	Provide learning support to learners who are falling behind their peers	1	
6	Arranging objects according to their lengths	Arrange objects according to their lengths.	1	
7	Addition of length measurements	Add measurements of length.	1	1
8	Subtraction of length measurements	Subtract measurements of length.	1	1
9	Multiplying length measurements by a number	Multiply length measurements by a number.	1	
10	Dividing length measurement by a number	Divide length measurement by a number.	1	
11	End unit assessment	Measure and show the relationship between length measurements, compare, add, subtract , and multiply/ divide length measurements by a number.	1	
	Total		12	4

5.5 Guidance on different lessons of unit 5

Lesson 1: Guidance on introductory activity 5

- Invite pupils to read the story of Gahire who does not know the length and the width of his farm;
- Guide pupils to discuss the reason one can fail to determine the length of his own land;
- Ask them to suggest what is required for every one of them to be able to determine the size (length of an object);
- Move around in the classroom to get aware of different suggestions and ask some probing questions where necessary.
- Invite all pupils to a class discussion and basing on their experience, prior knowledge and abilities shown in answering questions for this activity, open a discussion with probing questions to guide them to give their predictions and ensure that you arouse their curiosity on what is going to be learnt in this unit so that they may be able to manage different quantities of their properties.

Lesson 2: Relationship between length measurements and their conversion

a) Objectives

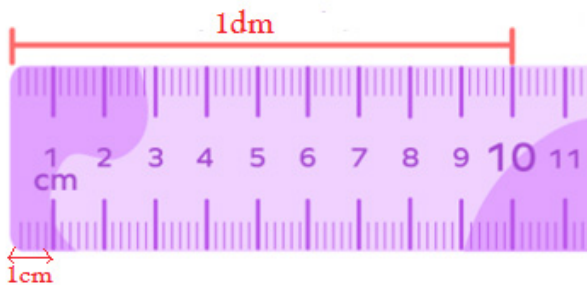
Show length measurements and their conversion.

b) Teaching resources and learning resources

- Different instruments of measuring the length: metre or centimetre rulers, folding metre, measuring tape, etc,
- Large areas or spaces whose perimeter can be measured: rooms, hall, garden.
- Gridded paper, diagrams or pictures of exact measurements.
- Conversion table of length measurements.

c) Teaching and learning activities:

Invite pupils to observe and compare the length of **1dm** and the length of **1cm** on a ruler.



Complete:

$$1 \text{ dm} = \underline{\quad} \text{ cm}$$

- Present a conversion table of length measurements to pupils and ask some pupils to write the given measurements in the table, and to convert from a unit to another;

Length measurements greater than metre			Standard unit of length measurements	Length measurements smaller than metre		
<i>km</i>	<i>hm</i>	<i>dam</i>	<i>m</i>	<i>dm</i>	<i>cm</i>	<i>mm</i>
		1	0			
			1	0		
				1	0	
					1	0

1dm = 10 cm, 1cm =10 mm, 1m = 100cm.

- Organize groups of pupils and give them activities to do (for example **Activity 5.2.1, Activity 5.2.2, and Activity 5.2.3**).
- Move around in the classroom and provide probing questions for assistance where necessary;
- Invite some groups to present and guide the class to harmonize on how to convert the units of length measurements. .

d) Synthesis/summarization

Guide pupils to summarize the relationship between length measurements, and how to convert from a unit to another using a conversion table.

Guide pupils to highlight how to convert compound units to a single unit.

e) Assessment

- Give activities to be done by pupils (application activity 5.2) and check their answers.
- Assign all pupils a homework.

f) Answer for activities

Activity 5.2.1

- | | |
|-------------------|-----------------|
| a) 8 km = 80 hm | c) 2hm = 20dam |
| b) 7 km = 700 dam | d) 4 hm = 400 m |

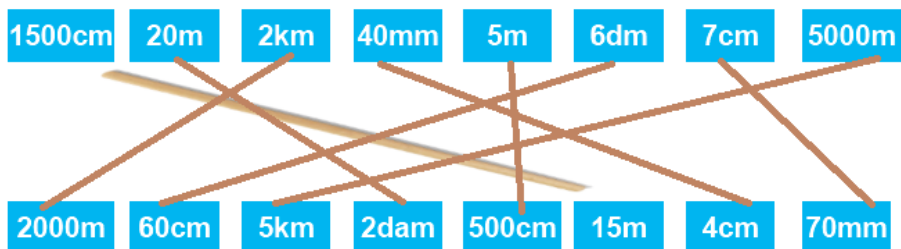
Activity 5.2.2

- | | |
|------------------|-----------------|
| a) 90 hm = 9 km | c) 60dam = 6 hm |
| b) 800 dam = 8km | d) 500m = 5hm |

Application activity 5.2

- | | | |
|---------------------|--------------------|---------------------|
| 1. a) 450 m = 45dam | e) 4 300 dm = 430m | h) 4dm = 400 mm |
| b) 13hm = 1300m | f) 234m = 2340dm | i) 6m = 60dm |
| c) 56dam = 5 600dm | g) 8km = 8 000m | j) 9dam = 9 000cm . |
| d) 3 500 mm = 35dm | | |

2.



Lesson 3: Measuring the length of objects

a) Objective:

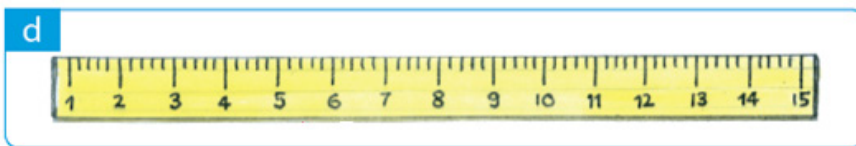
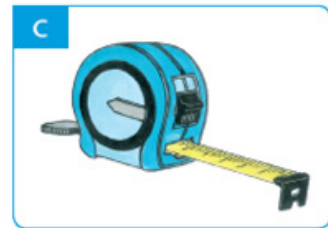
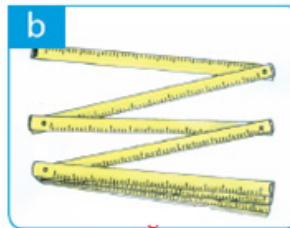
Measure the length of objects.

b) Teaching resources and learning resources

- Different instruments of measuring the length: metre or centimetre rulers, folding metre, measuring tape, etc,
- Large areas or spaces whose perimeter can be measured: rooms, hall, garden.
- Gridded paper, diagrams or pictures of exact measurements.
- Conversion table of length measurements.

c) Teaching and learning activities:

- Invite pupils to observe learning materials and explain instructions on activities to be done (use **activity 5.1.1**). The tools used to measure the length: There is a decametre tool, a tape measure, a measuring tape for tailors, a folding ruler, or a ruler.



- Guide them to discover how to measure the length of an object and materials to be used;
- Form groups of pupils and give them instruments for length measurement and ask them to measure the lengths of different objects and record them on sheets of paper;

- Assign groups to do the activity **5.1.2**, **activity 5.1.3** and **activity 5.1.4** for discussion
- Ask some groups to present their findings and guide the class to harmonize how to measure the length and different instruments to be used.

d) Synthesis/summarization

Guide pupils to summarize how to measure the length and different instruments to be used.

e) Assessment

Provide activities to pupils from the pupil's book (**application activity 5.1**).

Lesson 4: Comparing length measurements

a) Objectives

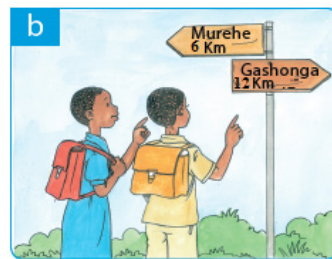
Compare length measurements.

b) Teaching resources and learning resources

- Different instruments of measuring the length: metre or centimetre rulers, folding metre, measuring tape, etc,
- Objects of different lengths to be measured and compared: rooms, hall, garden.
- Gridded paper, diagrams or pictures of exact measurements.
- Conversion table of length measurements.

c) Teaching and learning activities:

- Invite one pupil in front of others and guide him/her on how to measure and record lengths of 2 objects using a metre ruler (refer to **activity 5.3.1**)
- Ask them to say which object is longer than the other. Then, guide them to compare the obtained measurements by using $<$, $>$ or $=$;



The big ruler has 100cm. The small ruler has 30 cm. The big ruler is longer than the small ruler. In the same way, **100cm > 30cm**.

- Show pupils objects of different lengths and ask them to compare the lengths of them before measuring where they say the longest and the shortest (refer to **activity 5.3.2**);
- Guide pupils to do **activity 5.3.2**
- Move around in the classroom and provide probing questions for assistance where necessary;
- Invite some groups to present and guide the class to harmonize on how to compare lengths of objects.

d) Synthesis/summarization

- Guide pupils to summarize how to compare lengths of objects: *use a conversion table to convert all lengths in the smallest unit given and then to compare obtained values.*

e) Assessment

- Provide activities to be done by pupils (use the **application activity 5.3**) and check their answers;
- Assign all pupils homework to do.

f) Answer for activities

Activity 5.3.3

It is better to convert in the smallest unit before comparing.

- | | | |
|------------------|--------------------|------------------|
| a) 234 m > 23 hm | c) 49dm < 9 m | e) 256cm > 25 dm |
| b) 3km = 300dam | d) 87dam = 8700 dm | f) 57mm > 5cm |

Application activity 5.3

- | | |
|-------------------|------------------|
| 1) a) 3 km = 30hm | c) 575 dm > 57 m |
| b) 4 hm = 407m | d) 49dam < 9hm |
- 2) 45 km: 9km = 5 times.

Note: After this lesson, organize another lesson for arranging length measurements in a given order. You can start by arranging the lengths for concrete objects before assigning pupils in groups to do the activity 5.4.1 and activity 5.4.2.

Activity 5.4.1

- | | |
|------------------------|-----------------------|
| a) 125 m, 8 dam, 2hm, | d) 6dam, 765 dm, 98 m |
| b) 34 cm, 245 mm, 5dm, | e) 256 m, 54dam, 8km |
| c) 75hm, 8 759 m, 9km | f) 356cm, 49dm, 7m. |

Activity 5.4.2

- | | |
|-----------------------|----------------------|
| a) 9hm, 785m, 54dam | d) 8km, 56hm, 237dam |
| b) 76hm, 79dam, 247m, | e) 92m, 8dam , 797dm |
| c) 49dm, 39cm, 91mm, | f) 9km, 59dam, 48hm. |

Application activity 5.4

- | | |
|------------------------------|---------------------------|
| 1) a) 985mm, 985mm, 7m | c) 765mm, 324cm, 8m. |
| b) 79m, 897dm, 9dam | d) 789mm, 87cm, 987dm |
| 2) a) 9 124 m, 698 dam, 6 km | c) 987dm, 7dam, 3 695 cm. |
| b) 9 km, 768 dam, 74hm | d) 915dm, 76m, 4 897cm. |

Lesson 6: Addition of length measurements

a) Objectives

Add measurements of length

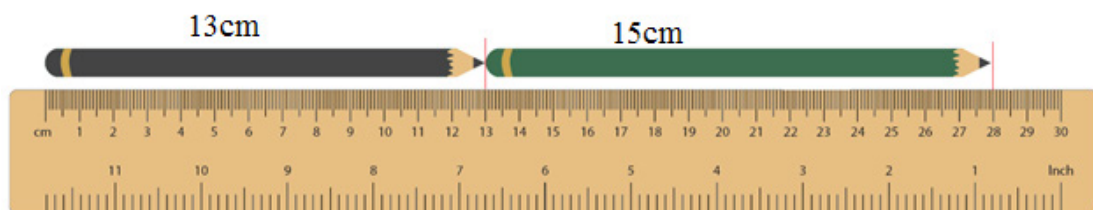
b) Teaching resources and learning resources

- Different instruments of measuring the length: metre or centimetre rulers, folding metre, measuring tape, etc,
- Objects of different lengths to be measured and compared: rooms, hall, garden.
- Gridded paper, diagrams or pictures of exact measurements.
- Conversion table of length measurements.

c) Teaching and learning activities:

- Invite one pupil in front of others and guide him/her on how to add length measurements (Use **Activity 5.5.1** as guiding learning activity).

The pupil observes and notes the length of each pencil on the ruler. Then, he/she puts the two pencils on the ruler to record the total length:



$$13\text{cm} + 15\text{cm} = \underline{\quad}\text{cm}$$

- Make a review on adding vertically and converting length measurement
- Guide pupils to convert in the smallest unit or in the requested unit, and then add them using standard written method;
- Organize pupils in groups and assign them to do Activity 5.5.2;
- Move around in the classroom and provide probing questions for assistance where necessary;
- Invite some groups to present and guide the class to harmonize on how to add length measurements;

d) Synthesis/summarization

- Guide pupils to summarize how to add length measurements: **use a conversion table to convert in the smallest unit or in the requested unit, and then add them using standard written method.**

e) Assessment

- Provide activities to be done by pupils (**application activity 5.5**) and check their answers.
- Assign homework to be done by all pupils.

f) Answer for activities

Activity 5.5.2

- | | |
|--|--|
| a) $9 \text{ km} + 789 \text{ m} = 9 \text{ 789 m}$ | d) $5 \text{ m} + 500 \text{ cm} = 1 \text{ dam}$ |
| b) $56 \text{ hm} + 238 \text{ m} = 5 \text{ 838 m}$ | e) $300 \text{ dm} + 20 \text{ m} = 5 \text{ dam}$ |
| c) $400 \text{ dam} + 2 \text{ 500 m} = 65 \text{ hm}$ | f) $35 \text{ cm} + 9 \text{ m} = 935 \text{ cm}$ |

Activity 5.5.3

- 1) Number of km he covered altogether: $359\text{km} + 4360\text{hm} = 795\text{km}$
- 2) Number of metres of cloth they have altogether: $175\text{m} + 1250\text{dm} = 300\text{m}$
- 3) The length of both ropes: $150\text{m} + 2500\text{dm} = 400\text{m}$.

Application activity 5.5

- 1) a) $47 \text{ hm} + 930 \text{ dam} = 14\text{km}$ b) $3 \text{ m} + 25\text{dm} = 550\text{cm}$
 c) $45\text{m} + 5 \text{ 500 cm} = 1\text{hm}$
- 2) The length of the road from Kigali to Rusizi: $125 \text{ km} + 1670 \text{ hm} = 292 \text{ km}$
- 3) The length of both gardens: $95 \text{ m} + 105 \text{ m} = 200 \text{ m}$.

Lesson 7: Subtraction of length measurements

a) Objectives

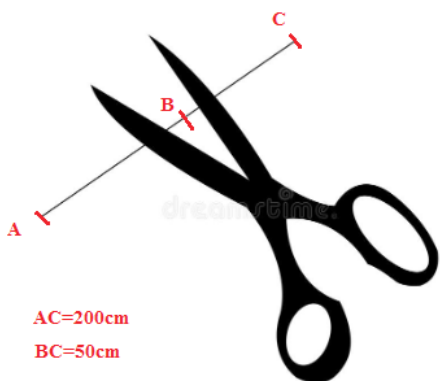
Subtract measurements of length.

b) Teaching resources and learning resources

- Different instruments of measuring the length: metre or centimetre rulers, folding metre, measuring tape, etc,
- Objects of different lengths to be measured and compared: rooms, hall, garden.
- Gridded paper, diagrams or pictures of exact measurements.
- Conversion table of length measurements.

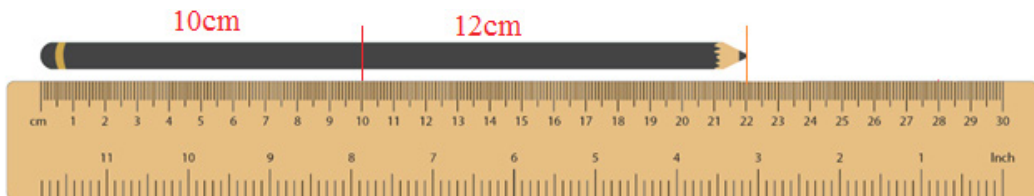
c) Teaching and learning activities:

- Assign pupils to do **activity 5.6.1** in pair
- Invite one pupil in front of others and guide him/her on how to demonstrate subtraction of length measurements.



- 1) The distance of a rope from A to C is 200cm. They cut the part BC. What is the length of the remaining rope?

- 2) A pencil with 22cm is cut into two parts. The first part has 12cm. How long is the second part?



- Organize groups of pupils and give them activities to do (for example **Activity 5.6.2**);
- Move around in the classroom and provide probing questions for assistance where necessary;

- Invite some groups to present and guide pupils to harmonize on how to carry out the subtraction involving length measurements;
- Assign the same groups to do **activity 5.6.3**;
- Guide pupils to understand the problem by draw visual representations and then solve the problem using the division
- Move around in the classroom and check how they are performing
- Invite some groups to presents their findings and harmonize their works.

d) Synthesis/summarization

- Guide pupils to summarize how to subtract length measurements: use a conversion table to convert in the smallest unit or in the requested unit, and then subtract using standard written method.

e) Assessment

- Provide activities to be done by pupils (**application activity 5.6**) and check their answers.
- Assign homework to be done by all pupils.

f) Answer for activities

Activity 5.6.2

$$\text{a) } 5 \text{ hm} - 298 \text{ m} = 202 \text{ m}$$

$$\text{d) } 75 \text{ cm} - 579 \text{ mm} = 171 \text{ mm}$$

$$\text{b) } 9 \text{ km} - 832 \text{ dam} = 68 \text{ dam}$$

$$\text{e) } 753 \text{ dam} - 69 \text{ hm} = 630 \text{ m}$$

$$\text{c) } 74 \text{ dm} - 490 \text{ cm} = 250 \text{ dm}$$

$$\text{f) } 835 \text{ dm} - 7 \text{ dam} = 135 \text{ dm}$$

Activity 5.6.3

1) Number of km remained to complete the race: $42 \text{ km} - 2900 \text{ dam} = 13 \text{ km} = 130 \text{ hm}$

2) Number of metres she remained with: $175 \text{ m} - 9 \text{ dam} = 85 \text{ m}$

3) Muhizi is taller than Kaneza, their difference in height is : $186 \text{ cm} - 169 \text{ cm} = 17 \text{ cm}$

Application activity 5.6

$$1) \text{ a) } 5 \text{ km} - 28 \text{ hm} = 220 \text{ dam}$$

$$\text{b) } 9 \text{ hm} - 73 \text{ dam} = 170 \text{ m}$$

$$\text{c) } 724 \text{ cm} - 62 \text{ dm} = 104 \text{ cm}$$

$$\text{d) } 415 \text{ dam} - 3 \text{ km} = 1150 \text{ m}$$

$$\text{e) } 64 \text{ dam} - 440 \text{ m} = 2 \text{ hm}$$

$$\text{f) } 36 \text{ m} - 973 \text{ cm} = 2627 \text{ cm}$$

2) Number of metres he remained with: $12 \text{ dam} - 20 \text{ m} = 100 \text{ m}$

3) Ishimwe jumped long length. The difference is: $3 \text{ m} - 21 \text{ dm} = 50 \text{ cm}$.

Lesson 8: Multiplying length measurements by a number

a) Objectives

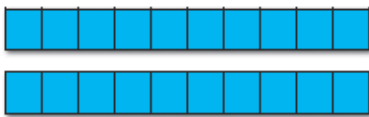
Multiply length measurements by a number.

b) Teaching resources and learning resources

- Different instruments of measuring the length: metre or centimetre rulers, folding metre, measuring tape, etc,
- Objects of the same lengths to be aligned and measured: sticks, pens, rulers pencils, - Gridded paper, diagrams or pictures of exact measurements.
- Conversion table of length measurements.

c) Teaching and learning activities:

- Using concrete materials, guide pupils to discover how to multiply length measurements by a number; for example two sticks put together where each one measures 10 cm



- 1) Ask pupils to say the total length of two sticks when they are put on the same line one by another. Let them give their answer by involving the multiplication.

- 2) There are 4 equal parts of sugarcane. Each one is 25 cm.



What is their total length when they are put together?

- Ask pupils to do in pair **activity 5.7.1**
- Organize groups of pupils and give them activities to do (for example **Activity 5.7.2**);
- Move around in the classroom and provide probing questions for assistance where necessary;
- Invite some groups to present and guide the class to harmonize on how to find a product of length measurement by a number.
- Assign the same groups to do **activity 5.7.3**
- Guide pupils to understand the problem by draw visual representations and then solve the problem involving multiplication.
- Move around in the classroom and check how they are performing
- Invite some groups to presents their findings and harmonize their works

d) Synthesis/summarization

Guide pupils to summarize how to find a product of length measurement by a number: **convert the measurement in the smallest unit given**, multiply the obtained value by the given number and copy that small unit then convert the result in the requested unit.

e) Assessment

- Provide activities to be done by pupils (**application activity 5.7**) and check their answers.
- Assign homework to all pupils.

f) Answer for activities

Activity 5.7.3

- 1) The length of 6 pieces of cloth: $50 \text{ m} \times 6 = 300 \text{ m}$
- 2) Number of metre of electric wire they have altogether: $30 \text{ m} \times 3 = 90 \text{ m}$
- 3) Length of all sticks: $2 \text{ m} \times 56 = 112 \text{ m}$

Application activity 5.7

- 2) The length of a flat: $4 \text{ m} \times 8 = 32 \text{ m}$
- 3) The length of the new made big piece of thread: $100 \text{ m} \times 9 = 900 \text{ m}$
- 4) Total length of that piece of cloth $9 \text{ dam} \times 6 = 54 \text{ dam}$
- 5) The total length: $5 \text{ m} \times 127 = 635 \text{ m}$

Lesson 9: Dividing a length measurement by a number

a) Objectives

Divide length measurement by a number.

b) Teaching resources and learning resources

- Different instruments of measuring the length: metre or centimetre rulers, folding metre, measuring tape, etc;
- Objects of the same lengths to be aligned and measured: sticks, pens, rulers pencils, etc.
- Gridded paper, diagrams or pictures of exact measurements.
- Conversion table of length measurements.

c) Teaching and learning activities:

- Invite one pupil in front of others and guide him/her on how to demonstrate the division of length measurement in a given number of parts: long stick of 6 dm to be cut in 3 equal parts of the same length:



- Ask other pupils to say the length for each part (they will find that it is equal to 3 dm). Invite them to use the division to explain how they find their answer.
- You can bring a sugar can of 100cm. The sugarcane is divided into 4 equal parts. Ask them to find the length of one part by using the division.

100cm



- Organize groups of pupils and assign them activities to do **activity 5.8.1**.
- Move around in the classroom and provide probing questions for assistance where necessary;
- Invite some groups to present and guide the class to harmonize on how to divide length measurements by a number;
- Assign the same groups to do **activity 5.8.2**;
- Guide pupils to understand the problem by draw visual representations and then solve the problem using the division
- Move around in the classroom and check how they are performing
- Invite some groups to presents their findings and harmonize their works.

d) Synthesis/summarization

Guide pupils to summarize how to divide length measurements by a number: **convert the measurement in the smallest given unit**, divide the obtained value by the given number and copy that small unit then convert the result in the requested unit.

e) Assessment

- Provide activities to be done by pupils and check their answers.
- Assign homework to all pupils.

f) Answer for activities

Activity 5.8.1

a) $580 \text{ dm} : 5 = 1160 \text{ cm}$

b) $2400 \text{ dam} : 6 = 4\text{km}$

c) $5400 \text{ mm} : 9 = 6 \text{ dm}$

d) $480 \text{ cm} : 8 = 6 \text{ dm}$

e) $1200 \text{ m} : 3 = 4 \text{ hm}$

f) $2000 \text{ dm} : 4 = 5 \text{ dam}$

Application activity 5.8

- 1) a) $248 \text{ hm} : 8 = 3100 \text{ m}$ d) $680 \text{ cm} : 4 = 17 \text{ dm}$
b) $485 \text{ dam} : 5 = 970 \text{ m}$ e) $650 \text{ dm} : 5 = 13 \text{ m}$
c) $2800 \text{ m} : 7 = 4 \text{ hm}$ f) $960 \text{ cm} : 3 = 3200 \text{ mm}$
- 2) The length of each small piece of cloth: $49 \text{ m} : 7 = 70 \text{ dm}$.

5.6. Ending points of the unit

a) Summary of the unit

Try to summarize the content for this unit.

b) Additional information for the teacher

- The teacher plays an important role in the learning activity, guide all learning situations and engage every pupil;
- Introduce the concept of length using concrete objects and manipulative materials;
- Teach pupils different ways of measuring the length; Use of non-standard units and the use of standard units;
- Invite pupils to create stories from given number sentences involving length measurements, estimating distances before measuring them.
- Pose to pupils, daily problems in the form of words, tables and pictorials.

5.7. Answers for the end unit assessment 5

- 1) a) $2 \text{ km } 6 \text{ m} = 2006 \text{ m}$ d) $2400 \text{ dm} = 24 \text{ dam}$
b) $240 \text{ dm} = 24 \text{ m}$ e) $4 \text{ hm } 8 \text{ dm} = 4008 \text{ dm}$
c) $7 \text{ m } 8 \text{ mm} = 7008 \text{ mm}$ f) $4500 \text{ m} = 45 \text{ hm}$
- 2) a) $456 \text{ m} < 8 \text{ hm } 5 \text{ dam}$ c) $8 \text{ km } 9 \text{ dam} > 789 \text{ dam}$
b) $46 \text{ mm} = 4 \text{ cm } 6 \text{ mm}$ d) $7 \text{ dam } 9 \text{ dm} < 79 \text{ m}$
- 3) $2 \text{ hm } 9 \text{ m}; 259 \text{ m}, 29 \text{ dam } 5 \text{ m}$.
- 4) $608 \text{ hm}, 6 \text{ km } 8 \text{ dam}, 68 \text{ dam}$.
- 5) a) $75 \text{ dam} \times 4 = 3 \text{ km}$ c) $4 \text{ m } 8 \text{ cm} \times 5 = 204 \text{ dm}$
b) $590 \text{ m} \div 5 = 1180 \text{ dm}$ d) $6400 \text{ dm} : 8 = 8 \text{ dm}$
- 6) a) 750 dm b) 12 dam c) $108 \text{ m} + 56 \text{ m} = 164 \text{ m}$ d) 108 m
e) $\text{Kamana ran} : 108 \text{ m} + 56 \text{ m} + 64 \text{ m} + 108 \text{ m} + 125 \text{ m} + 75 \text{ m} = 536 \text{ m}$.

7) Peter un: $500 \text{ m} \times 6 = 3000 \text{ m} = 3\text{km}$.

8) The length for every rope: $36 \text{ m} \div 9 = 4\text{m} = 400\text{cm}$.

Remedial activities

1) Convert these units:

a) $2 \text{ m } 8\text{cm} = \dots \text{ cm}$

b) $8 \text{ km} = \dots \text{ hm}$

c) $7 \text{ dam } 6\text{dm} = \dots \text{ dm}$

2) Arrange from the smallest to the biggest

4 hm, 67m, 8km, 37dam.

3) Arrange from the biggest to smallest

9m, 456mm, 18dm, 789cm

4) Use $>$, $<$ or $=$ to compare

a) $45 \text{ m} \dots 4 \text{ dam } 5\text{dm}$

b) $72 \text{ dam} \dots 720\text{m}$

c) $36 \text{ hm} \dots 3\text{km } 98\text{dam}$

5) Work out

a) $245 \text{ m} + 550 \text{ dm} = \dots \text{hm}$

c) $125 \text{ cm} \times 4 = \dots \text{ m}$

b) $8\text{km} - 567\text{dcm} = \text{dam} \dots$

d) $800 \text{ dam} : 5 = \dots \text{hm}$

6) Read and find the answer:



The length of the second lorry is _____

7) Solve

a) Keza walks 5 km from home to the market. If she goes and then comes back, how many kilometres does she cover?

b) Musoni went from home to the head quarter of the province distant to 150km. After waking 900 hm, she gets tired and passes the night there. How long is the remaining distance.

c) Every day Akimana goes to school and this makes 4 km. Determine the total length of her journey in 5 days.

d) Share a4m sugarcane between 2 children. What is the length of one share?

Extension activities

1) Convert these units:

a) $45 \text{ dam } 8\text{dm} = \dots \text{ dm}$

b) $24 \text{ hm } 45\text{m} = \dots \text{ m}$

c) $38 \text{ dm } 97\text{mm} = \dots \text{ mm}$

2) Arrange from the smallest to the biggest

975 dam, 8 km, 79 hm, 9 875 m.

3) Arrange from the the biggest to smallest

8765 mm, 97 dm, 9m, 786 cm.

4) Use $>$, $<$ or $=$ to compare:

a) $4 \text{ hm } 9\text{dm} \dots 49\text{dam}$

b) $897 \text{ m } 6 \text{ dm} \dots 85\text{dam } 7\text{m}$

c) $75\text{dm } 9\text{mm} \dots 750\text{cm } 9\text{mm}$

5) Work out:

a) $4 \text{ } 560 \text{ mm} + 544\text{cm} = \dots\text{dm}$

c) $789\text{dam} \times 9 = \dots\text{dam}$

b) $9 \text{ } 780 \text{ dm} - 898\text{m} = \dots\text{dam}$

d) $9 \text{ } 882 \text{ km} : 9 = \dots \text{ km}$

6) Read and organize the sentences. Start by the first to the last.

When solving a word problem,

1)...	a) Mention the given data,
2)...	b) Find the solution by adding the converted units
3)...	c) Draw conversion table of length measurements
4)...	d) Convert the given units into the smallest unit or required unit
5) ...	e) Mention the item that is asked.

7) Solve these problems

a) On Monday a traveler made a journey of 75km, on Tuesday 870hm and 9600dam on Wednesday. How many kilometres did the traveler cover in those 3 days?

b) Kagisha participated in a race competition of 42km distance. However, he got tired and stopped the competition before running 2 900m to the end. How many kilometres did he run?

c) Abatoni had 75 equal ropes with 80cm each. Find the total length they can make altogether.

d) Share a rope of 441m equally among 9 girls. What is the length of each girl's rope in cm?

UNIT 6

MASS MEASUREMENTS FROM KILOGRAM TO GRAM

6.1. Key unit competence

Measure and compare the weight of different objects within 10kg. Addition, subtraction, multiplication and division of mass measurements from kg up to g.

6.2. Prerequisite

Pupils will easily learn this unit, if they have a good background on the mass measurements related to kg learnt in P2.

6.3. Cross-cutting issues to be addressed

- **Standardization Culture:** While measuring masses, pupils will discover how to verify the exact mass of objects and will sensitize the population about the culture of measuring the weight of goods when buying and selling.
- **Financial Education:** when the pupil knows that the quantity of objects was weighted, he/she will never waste them but will maintain and protect that quantity.
- **Gender balance:** provide equal opportunity to boys and girls in the lesson
- **Inclusive education:** promote education for all learners in the teaching and learning activities.
- **Environment and sustainability:** This will be addressed when pupils will be maintaining hygiene for their classroom and for materials they used.
- **Peace and values education:** addressed when pupils are encouraged to work collaboratively and peacefully in their group.

6.4. Sub-headings/List of lessons

UNIT 6: MASS MEASUREMENTS FROM KILOGRAM TO GRAM (16 periods)			Reinforcement and Extension	
	Lesson title	Learning objectives	Number of periods	
1	Introductory activity	Arouse the curiosity of learners on the importance of measuring, reading and writing mass measurements.	1	
2	Measuring, reading and writing the mass of objects	Measure, read and write the mass of objects.	1	
3	Relationship between mass measurements and their conversion	Show relationship between mass measurements and their conversion.	1	1
4	Comparing mass measurements	Compare mass measurements.	1	1
5	Arranging objects according to their mass	Arrange objects according to their mass.	1	
6	Remediation	Provide learning support to learners who are falling behind their peers	1	
7	Addition of mass measurements	Add mass measurements.	1	1
8	Subtraction of mass measurements	Subtract mass measurements.	1	1
9	Multiplying mass measurements by a number	Multiply mass measurements by a number.	1	
10	Dividing mass measurement by a number	Divide mass measurement by a number.	1	
11	End unit assessment	Measure and compare the weight of different objects not exceeding 10kg, add, subtract, multiply and divide mass measurements from kg to g.	1	
12	Remediation	Provide learning support to learners who are falling behind their peers	1	
	Total		12	4

6.5. Teaching and learning activities

Lesson 1: Guidance on introductory activity 6

- Invite pupils to read the story of Sano who does not know how to use balances to measure the mass of his harvest;
- Guide pupils to discuss the reason one can fail to determine the mass of his goods;
- Ask them to suggest what is required for every one of them to be able to determine the mass of objects;
- Move around in the classroom to get aware of different suggestions and ask some probing questions where necessary.
- Invite all pupils to a whole class discussion and basing on their experience, prior knowledge and abilities shown in answering questions for this activity, open a discussion with probing questions to guide them to give their predictions and ensure that you arouse their curiosity on what is going to be learnt in this unit so that they may be able to manage different quantities of their properties.

Lesson 2: Reading, writing and measuring the mass of objects

a) Objectives

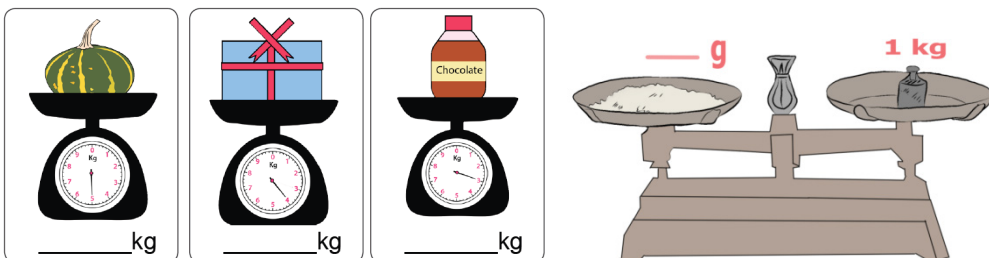
Measure, read and write the mass of objects

b) Teaching resources and learning resources

- Different types of balances of measuring the mass: spring, digital balance, top beam balance, double beam balance, etc.

c) Teaching and learning activities:

- Invite pupils to observe learning materials and give instructions of activities to be done (use **activity 6.5.1**);
- Guide them to discover how to measure the mass of an object and materials to be used:



- Form groups of pupils and give them balances and ask them to measure the mass of different objects and record them on sheets of paper;

- Assign groups to do **activity 6.1.2**, **activity 6.1.3** and **activity 6.1.4** for discussion;
- Ask some groups to present their findings and guide the whole class to harmonize how to measure the mass and how to read and write them correctly.

d) Synthesis/summarization

Guide pupils to summarize how to measure the mass and how to read and write them correctly.

e) Assessment

Provide activities to pupils from the pupil's book.

f) Answers of activities

Lesson 3: Relationship between mass measurements and their conversion

a) Objectives

Show relationship between mass measurements and their conversion

b) Teaching resources and learning resources

- Different types of balances of measuring the mass: spring, digital balance, top beam balance, double beam balance, etc.
- Conversion table of mass measurements.

c) Teaching and learning activities:

- Present a conversion table of mass measurements to pupils, guide them to read mass measurements in kg, hg, dag and g; and ask pupils to write the given measurements in the table, and to convert from a unit to another. For example,

<i>kg</i>	<i>hg</i>	<i>dag</i>	<i>g</i>
5	0	0	
1	2		
	4	3	
	4	0	0

5kg = 50 hg = 500 dag. 12hg = 120 dag,. 400g = 40 dag = 4 hg. Etc.

- Organize groups of pupils and give them activities to do (for example **Activity 6.2.1**, **activity 6.2.2**, **activity 6.2.3** and **activity 6.2.4**).

- Move around in the classroom and provide probing questions for assistance where necessary;
- Invite some groups to present and guide the whole class to harmonize on how to convert the units of mass measurements.

d) Synthesis/summarization

Guide pupils to summarize the relationship between mass measurements, and how to convert from a unit to another using a conversion table.

e) Assessment

- Provide activities to be done by pupils (see **application activity 6.2**) and check their answers.
- Assign all pupils homework to be done.

f) Answer for activities

Activity 6.2.3

1) Read and match the abbreviations of mass measurements with their full written

kg	Hectogram
hg	Gram
dag	Kilogram
g	Decagram

2) Answer **true** or **false**

- It is good to buy non-weighted items/objects : **False**
- Kilogram (kg) is the standard unit of mass measurements: **True.**

Lesson 4: Comparing mass measurements

a) Objectives

Comparing mass measurements.

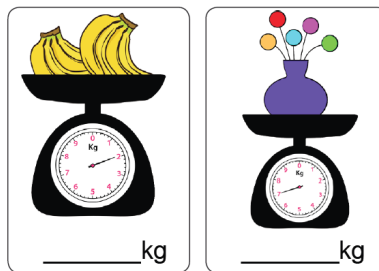
b) Teaching resources and learning resources

- Different types of balances of measuring the mass: spring, digital balance, top beam balance, double beam balance, etc.
- Conversion table of mass measurements.

c) Teaching and learning activities:

- Show pupils objects of different weights and ask them to compare their masses before measuring where they say the lightest and the heaviest (refer to **activity 6.3.1** and **activity 6.3.2**);

For example: between 2kg and 7kg what is heavy? Do you agree that $7\text{kg} > 2\text{kg}$? how is it on the balance?



- Invite one pupil in front of others and guide him/her on how to measure and record mass of objects using a balance and then compare the obtained measurements using $<$, $>$ or $=$;
- Organize groups of pupils and give them activities to do (for example **Activity 6.3.3** and **activity 6.3.4**);
- Move around in the classroom and give probing questions for assistance where necessary;
- Invite some groups to present and guide the whole class to harmonize on how to compare weights of objects.

d) Synthesis/summarization

- Guide pupils to summarize how to compare weights of objects: *use a conversion table to convert all masses in the given smallest unit and then to compare obtained values.*

e) Assessment

- Provide activities to be done by pupils (use the **application activity 6.3**) and check their answers;
- Assign all pupils homework to do.

f) Answer for activities

Answers for activity 6.3.4

- a) $2\text{kg} < 203\text{dag}$ b) $67\text{hg} = 670\text{dag}$ c) $89\text{dag} > 8\text{kg}$

Application activity 6.3

- a) $908\text{g} > 9\text{hg}$ b) $5\text{kg} < 75\text{hg}$ c) $135\text{dag} > 12\text{hg}$

Note: After this lesson, organize another lesson for arranging mass measurements in a given order. You can start by arranging the mass for concrete objects before assigning pupils in groups. Refer to activity 6.4.1, activity 6.4.2 and activity 6.4.3.

Answers for activity 6.4.2

- a) 530 g, 45 dag, 79 hg d) 4kg, 576dag, 76hg
b) 52hg, 549dag, 52hg, 9kg e) 345dag, 56hg, 8kg
c) 310g, 79dag, 48hg. f) 271g, 54dag, 9kg.

Answers for activity 6.4.3

- a) 7kg, 65hg, 791g b) 4kg, 869g, 24dag
c) 9kg, 68hg, 153dag d) 245hg, 5kg, 64dag.

Answers for application activity 6.4

1. a) 184g, 54dag, 6hg c) 58g, 7hg, 87dag
 b) 45dag, 27hg, 9kg d) 97g, 96dag, 6kg.
2. a) 57hg, 5kg, 897 g c) 7kg, 48dag, 38g
 b) 18hg, 29dag, 47g d) 68hg, 164dag, 91g.

Lesson 7: Addition of mass measurements

a) Objectives

Add mass measurements

b) Teaching resources and learning resources

- Balances of measuring the mass;
- Gridded paper, diagrams or pictures of exact measurements.
- Conversion table of length measurements.

c) Teaching and learning activities:

- Invite one pupil in front of others and guide him/her on how to demonstrate the addition of mass measurements starting by using a balance followed by conversion table to convert in the smallest unit or in the requested unit, and then add them using standard written method;

Example: 4 kg + 25 hg = ___ dag.

	kg	hg	dag	g
	4	0	0	
+	2	5	0	
	6	5	0	

Then, 4 kg+25 hg= 400 dag + 250 dag = 650 dag

- Organize groups of pupils and give them activities to do **activity 6.5.1**;
- Move around in the classroom and provide probing questions for assistance where necessary;
- Invite some groups to present and guide the whole class to harmonize on how to add mass measurements;
- Assign the same groups to do **activity 6.5.2**
- Help pupils to solve a one –step or a two-step of a problem:
- Guide them to understand the problem,
- Identify facts (given and requested),
- Draw visual representations and solve the problem using the addition.
- Invite some groups to present and guide the whole class to harmonize their work.

d) Synthesis/summarization

- Guide pupils to summarize how to add mass measurements: **use a conversion table to convert in the smallest unit or in the requested unit and then add them using standard written method.**

e) Assessment

- Provide activities to be done by pupils (**application activity 6.5**) and check their answers.
- Assign homework to be done by all pupils.

f) Answer for activities

Activity 6.5.1

- a) $100 \text{ dag} + 70 \text{ hg} = 8 \text{ kg}$
- b) $50 \text{ hg} + 400 \text{ dag} = 9 \text{ kg}$
- c) $80 \text{ dag} + 7 \text{ 00g} = 15 \text{ hg}$
- d) $7 \text{ kg} + 3 \text{ hg} = 730 \text{ dag}$

Activity 6.5.2

- 1) Number of kg of mixture for flours he got: $56 \text{ kg} + 195 \text{ kg} = 251 \text{ kg}$
- 2) Number of kg he harvested in those two seasons: $987 \text{ kg} + 9100 \text{ dag} = 1 \text{ 078 kg}$

Application activity 6.5

- 1) a) $52 \text{ g} + 75 \text{ dag} = 802 \text{ g}$
b) $78 \text{ dag} + 220 \text{ g} = 1 \text{ 000 g}$
c) $6 \text{ kg} + 24 \text{ dag} = 624 \text{ dag}$
- 2) The weight in kg of all products the trader buys:
 $1000 \text{ hg} + 50 \text{ kg} = 150 \text{ kg}.$
- 3) The weight in kg of all products bought:
 $5 \text{ 000 g} + 10 \text{ hg} = 6 \text{ kg}.$

Lesson 8: Subtraction of mass measurements

a) Objectives

Subtract mass measurements.

b) Teaching resources and learning resources

- Different instruments of measuring the **mass**;
- Conversion table of **mass** measurements.

c) Teaching and learning activities:

- Invite one pupil in front of others and guide him/her on how to demonstrate subtraction of **mass** measurements starting by using a balance to measure objects and remove some of them from the balance and see the mass of remaining objects, using a conversion table to convert in the smallest unit or in the requested unit, and then subtract using standard written method;

Example: $425 \text{ dag} - 3 \text{ kg} = \text{ ____ dag}$

<i>kg</i>	<i>hg</i>	<i>dag</i>	<i>g</i>
4	2	5	
- 3	0	0	
1	2	5	

Then, $425 \text{ dag} - 3 \text{ kg} = 425 \text{ dag} - 300 \text{ dag} = 125 \text{ dag}$.

- Organize groups of pupils and motivate them to do Activity 6.6.1);
- Move around in the classroom and provide probing questions for assistance where necessary;
- Invite some groups to present and guide the whole class to harmonize on how to carry out the subtraction involving mass measurements.
- Assign the same groups to do activity 6.6.2
- Help pupils to solve a one –step or a two-step of a problem:
- Guide them to understand the problem,
- Identify facts (given and requested),
- Draw visual representations and solve the problem using the subtraction.
- Invite some groups to present and guide the whole class to harmonize their work.

d) Synthesis/summarization

- Guide pupils to summarize how to subtract mass measurements: use a conversion table to convert in the smallest unit or in the requested unit, and then subtract using standard written method;

e) Assessment

- Provide activities to be done by pupils (**application activity 6.6**) and check their answers.
- Assign homework to be done by all pupils.

f) Answer for activities

Activity 6.6.1

- a) 51g b) 186dag c) 8 850g

Activity 6.6.2

- 1) Number of kg he remained with: $65 \text{ kg} - 390 \text{ hg} = 26\text{kg}$.
- 2) Number of kg of rice my family remained with: $50\text{kg} - 1200\text{dag} = 380\text{hg}$.

Application activity 6.6

- 1) a) 42 hg b) 1 080g c) 17dag
- 2) The number of kg of sugar he remained with: $8\ 000 \text{ hg} - 5\ 000 \text{ dag} = 30\text{kg}$.
- 3) Number of kg she remained with: $100 \text{ kg} - 4\ 500 \text{ dag} = 55\text{kg}$.

Lesson 9: Multiplication of mass measurements by a number

a) Objectives

Multiply mass measurements by a number

b) Teaching resources and learning resources

- Different balances of measuring the mass;
- Objects of different mass or weights to be measured and compared;
- Conversion table of mass measurements.

c) Teaching and learning activities:

- Invite one pupil in front of others and guide him/her on how to demonstrate the multiplication of mass measurement by a number using concrete materials: two bottles where each one measures 1kg;

For example, When there are 8 boxes of soap; where each box weighs 25kg,



The mass of all boxes is $25\text{kg} \times 8 = 200\text{kg}$.

- Ask other pupils to say the total mass for them when they are put together on the same balance, then they will see that it is equal to $2 \times 100 = 200$ kg.
- Organize groups of pupils and invite them to do **Activity 6.7.1**;
- Move around in the classroom and give probing questions for assistance where necessary;
- Invite some groups to present and guide the whole class to harmonize their work.
- Assign the same groups to do **activity 6.7.2**
- Help pupils to solve a one –step or a two-step of a problem:
- Guide them to understand the problem,
- Identify facts (given and requested),
- Draw visual representations and solve the problem using multiplication.
- Invite some groups to present and guide the whole class to harmonize their presentation.

d) Synthesis/summarization

Guide pupils to summarize how to find a product of mass measurement by a number: **convert the measurement in the smallest unit given, multiply the obtained value by the given number and copy that small unit then convert the result in the requested unit.**

e) Assessment

- Provide activities to be done by pupils (**application activity 6.7**) and check their answers.
- Assign homework to all pupils.

f) Answer for activities

Activity 6.7.1

- a) 55hg c) 9hg e) 870dag
b) 1kg d) 92dag

Activity 6.7.2

- 1) The weight of 9 similar packets: $500g \times 9 = 45 \text{ hg}$.
2) Number of kg of rice we consume in 8 days: $500g \times 8 = 4 \text{ kg}$.

Application activity 6.7

- 1.a) 87 hg b) 2380g c) 27hg d) 69dag
2) Number of kg of flour he bought if each packet weighs 5kg: $5 \text{ kg} \times 8 = 40\text{kg}$.
3) The quantity of sugar processed in two days: $2 \text{ 750 kg} \times 2 = 5 \text{ 500 kg}$.
4) Number of kg of rice he harvested altogether: $100\text{kg} \times 9 = 900\text{kg}$.

Lesson 10: Dividing a length measurement by a number

a) Objectives

Divide mass measurement by a number

b) Teaching resources and learning resources

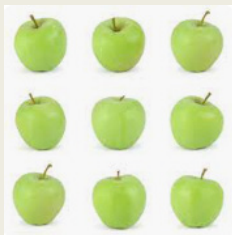
- Different balances of measuring the **mass**;
- Conversion table of **mass** measurements.

c) Teaching and learning activities:

- Organize groups of pupils and assign them to do **activity 6.8.1**;

There are 90g of apples. Share them equally to 3 children.

What is the mass of apples for each child?



All apples weigh 90g.



First child second child third child.

The mass for apples of each child = $90g \div 3 = 30g$

- Move around in the classroom and provide probing questions for assistance where necessary;
- Invite some groups to present and guide the whole class to harmonize on how to divide a weight by a whole number;
- Assign the same groups to do **activity 6.8.2**
- Help pupils to solve a one –step or a two-step of a problem;
- Guide them to understand the problem,
- Draw visual representations and solve the problem related to multiplication,
- Invite some groups to present their findings and guide the whole class to harmonize their presentation.

d) Synthesis/summarization

Guide pupils to summarize how to divide a mass by a number: **convert the measurement in the smallest unit given, divide** the obtained value by the given number and copy that small unit then convert the result in the requested unit.

e) Assessment

- Provide activities to be done by pupils and check their answers.
- Assign homework to all pupils.

f) Answer for activities

Answer for activity 6.8.1

a) hg 210 = kg 21 b) hg 11 c) dag 31 d) g 1 100

Activity 6.8.2

- 1) The share of each person: $200\text{kg} \div 8 = 25\text{kg}$
- 2) The share of each farmer: $9\ 600\ \text{dag} \div 8 = 12\text{kg}$
- 3) The weight of each packet in dag: $9\ 750\text{g} \div 5 = 195\text{dag}$

Application activity 6.8

- 1) a) $2000\ \text{dag} \div 5 = 400\ \text{dag}$ b) $1477\ \text{g} \div 7 = 211\ \text{g}$ c) $2080\ \text{g} \div 8 = 260\ \text{g}$
- 2) Number of g for each mango tree s: $840\text{g} \div 7 = 120\text{g}$
- 3) The share of each sector: $4\ 000\ \text{hg} \div 5 = 80\text{kg}$
- 4) The share of each person: $1\ 200\ \text{dag} \div 6 = 2\text{kg}$

6.6. Ending points of the unit

a) Summary of the unit

Try to summarize the content for this unit.

b) Additional information for the teacher

- The teacher plays an important role in the learning activity, guide all learning situations and engage every pupil;
- Introduce the concept of mass using concrete objects and manipulative materials;
- Teach pupils different ways of measuring the mass using nonstandard units and standard units;
- Invite pupils to create stories from given number sentences involving mass measurements, estimating weight before measuring them.
- Pose to pupils, daily problems in the form of words, tables and pictorials.

c) Answers for the end unit assessment 6

- 1) a) 800dag b) 560 dag c) 78hg d) 600g.
- 2) a) 74hg < 745dag b) 798g < 798dag
- 3) 487g, 48hg, 487dag.
- 4) a) 65hg, 6kg, 56dag b) 75hg, 657dag, 5kg
- 5) a) 10kg b) 90 hg c) 10dag
- 6) a) Number of kg he bought altogether: $750 \text{ hg} + 6 \text{ 500 dag} = 140\text{kg}$
b) Number of hg he bought altogether: $5\text{kg} \times 7 = 350 \text{ hg}$
c) Number of kg each got: $1 \text{ 000hg} : 4 = 25\text{kg}$.
d) Number of kg he returned back home if he had sold 6570 g only:
 $857\text{dag} - 6 \text{ 570g} = 2\text{kg}$.

d) Remedial activities

- 1) Convert the following units:
a) $5\text{kg } 8\text{g} = \underline{\hspace{1cm}}\text{g}$ b) $8\text{hg } 7\text{dag} = \underline{\hspace{1cm}}\text{g}$ c) $4\text{dag } 9\text{g} = \underline{\hspace{1cm}}\text{g}$
- 2) Arrange the following measurements in ascending order:
8hg, 97g, 5kg, 78dag
- 3) Arrange the following measurements in descending order:
99g, 56dag, 78hg, 9kg.
- 4) Use $>$, $<$ or $=$ to compare these measurements:
a) $95\text{hg} \underline{\hspace{1cm}} 9\text{kg}$ b) $79\text{dag} \underline{\hspace{1cm}} 790\text{g}$ c) $69\text{hg} \underline{\hspace{1cm}} 908\text{dag}$

5) Work out

a) $950\text{g} + 5\text{dag} = \underline{\hspace{2cm}}\text{kg}$

c) $15\text{hg} \times 8 = \underline{\hspace{2cm}}\text{kg}$

b) $5\text{kg} - 67\text{dag} = \underline{\hspace{2cm}}\text{dag}$

d) $560\text{dag} \div 7 = \underline{\hspace{2cm}}\text{hg}$

6) Solve the following problems:

a) On Monday Butera bought 75 kg of beans, on Tuesday 980 hg and 7 600 dag on Wednesday. How many kg did Butera buy altogether?

b) Umuhuza had 150kg of beans, after a while she sold 900hg. Determine in kg the quantity that remained.

c) Every day we consume 500g of sugar at home. How many kg do we use in 10 days?

d) Share 500kg of cassava flour equally among 5 families. What will be the quantity of flower for each family?

e) Extension activities

1) Convert the following units:

a) $58\text{ hg} = \underline{\hspace{2cm}}\text{ g}$

b) $87\text{dag} = \underline{\hspace{2cm}}\text{ g}$

c) $9\text{kg} = \underline{\hspace{2cm}}\text{ g}$

2) Arrange the following measurements in ascending order

72dag, 79hg, 9kg, 8 976 g.

3) Arrange the following measurements in descending order

7kg, 65hg, 875dag, 9 876 g.

4) Use $>$, $<$ or $=$ to compare these measurements:

a) $895\text{kg} \underline{\hspace{1cm}} 6597\text{hg}$

b) $6\ 570\text{g} \underline{\hspace{1cm}} 657\text{dag}$

c) $96\text{kg} \underline{\hspace{1cm}} 98\text{kg}$.

5) Work out

a) $950\text{hg} + 8\ 500\text{ dag} = \underline{\hspace{2cm}}\text{kg}$

b) $85\text{dag} - 767\text{g} = \underline{\hspace{2cm}}\text{g}$

c) $225\text{hg} \times 6 = \underline{\hspace{2cm}}\text{kg}$

d) $960\text{dag} \div 8 = \underline{\hspace{2cm}}\text{hg}$

6) Solve the following problems:

a) Last year Gwiza harvested 785kg of rice. This year he harvested 998kg of rice. Determine the total number of kg he harvested.

b) Muhorakeye had 50kg of beans. In the morning Muhorakeye sold 950dag of beans, and sold 9 000 g in the evening. How many kg did Muhorakeye sell?

c) Uwamahoro buys 98kg of rice every week. How many kg of rice does she buy in 52 weeks?

d) Share 9 459kg of rice equally among 9 shopping houses. What is the quantity of rice for one shopping house?

UNIT 7

CAPACITY MEASUREMENT FROM LITRE (l)TO MILLILITRE (ml)

7.1. Key unit competence

Measure and compare the capacity of different objects in litre. Addition, subtraction, multiplication and division of capacity measurements from litre (l) to millilitre (ml).

7.2. Prerequisite

Pupils will easily learn this unit, if they have a good background on the capacity measurements related to litre (l) learnt in P2.

7.3. Cross-cutting issues to be addressed

- **Standardization Culture:** While measuring the capacity, pupils will discover how to verify the exact capacity of containers and will sensitize the population about the culture of measuring the capacity when buying and selling.
- **Financial Education:** when a child knows that the quantity of objects was measured, he/she will never misuse them but will maintain and protect that quantity.
- **Gender balance:** provide equal opportunity to boys and girls in the lesson
- **Inclusive education:** promote education for all learners in the teaching and learning activities.
- **Environment and sustainability:** This will be addressed when pupils will be maintaining hygiene for their classroom and for materials they used.
- **Peace and values education:** addressed when pupils are encouraged to work collaboratively and peacefully in their group.

7.4. Sub-headings /list of lessons

UNIT 7: CAPACITY MEASUREMENT FROM LITRE (l)TO MILLILITRE (ml) (16 periods)			Reinforcement and Extension	
	Lesson title	Learning objectives	Number of periods	
1	Introductory activity	Arouse the curiosity of learners on the importance of measuring, reading and writing capacity measurements.	1	
2	Measuring, reading and writing the capacity of objects	Measure, read and write the capacity of objects.	1	1
3	Relationship between capacity measurements and their conversion	Show relationship between capacity measurements and their conversion.	2	1
4	Comparing capacity measurements	Compare capacity measurements.	1	
5	Remediation	Provide learning support to learners who are falling behind their peers	1	
6	Ordering capacity measurements	Arrange capacity measurements.	1	
7	Addition of capacity measurements	Add capacity measurements.	1	1
8	Subtraction of capacity measurements	Subtract capacity measurements.	1	1
9	Multiplying capacity measurements by a number	Multiply capacity measurements by a number.	1	
10	Dividing capacity measurements by a number	Divide capacity measurements by a number.	1	
11	End unit assessment	Measure and compare the capacity of different objects in litre; add, subtract, multiply and divide capacity measurements from litre (l) to millilitre (ml).	1	
	Total		12	4

7.5. Teaching and learning activities

Lesson 1: Guidance on introductory activity 7

- Invite pupils to read the story of Mutuzo who does not know to measure the quantity of milk he distributes to the milk collection centre;
- Guide pupils to discuss the reason one can fail to determine the quantity of a liquid such as milk, fuel or cooking oil;
- Ask them to suggest what is required for every one of them to be able to determine the capacity of liquid container;
- Move around in the classroom to get aware of different suggestions and ask some probing questions where necessary.
- Invite all pupils to a whole class discussion and basing on their experience, prior knowledge and abilities shown in answering questions for this activity, open a discussion with probing questions to guide them to give their predictions and ensure that you arouse their curiosity on what is going to be learnt in this unit so that they may be able to manage different quantities of liquids.

Lesson 2: Reading, writing and measuring the capacity of liquid containers.

a) Objectives

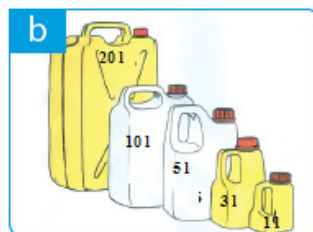
Measure, read and write the capacity of objects.

b) Teaching resources and learning resources

- Different bottles to be used when measuring the capacity of liquids in containers;
- Conversion table of capacity measurements.

c) Teaching and learning activities:

- Invite pupils to observe learning materials and give instructions of activities to be done (use **activity 7.1.1**). They can observe and read the capacity of different containers:



- Guide them to discover how to measure the capacity of a liquid container;

- Form groups of pupils and give them bottles and ask them to: measure the capacity of different liquids and record them on sheets of paper;
- Assign groups the **activity 7.1.2** and **activity 7.1.3** for discussion;
- Ask some groups to present the findings and guide the whole class to harmonize how to measure the capacity and how to read and write them correctly.

d) Synthesis/summarization

Guide pupils to summarize how to measure the capacity and how to read and write them correctly.

e) Assessment

Provide activities to pupils from the pupil's book (refer to **application activity 7.1**).

Lesson 3: Relationship between capacity measurements and their conversion

a) Objectives

Show relationship between capacity measurements and their conversion.

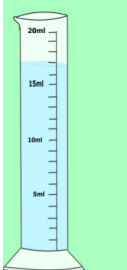
b) Teaching resources and learning resources

- Different bottles to be used when measuring the capacity of liquids in containers;
- Conversion table of capacity measurements.


c) Teaching and learning activities:

- Present a conversion table of capacity measurements to pupils, guide them to read capacity measurements: *l, dl, cl* and *ml* ; and ask pupils to write the given measurements in the table, and to convert from a unit to another;

Standard unit of capacity measurements	Capacity measurements which are less than a litre.		
	Decilitre (dℓ)	Centilitre (cℓ)	Millilitre (mℓ)
Litre (ℓ)			
1	0		
1	0	0	
1	0	0	0
	1	0	
	1	0	0
		1	0



Millilitres
we can use a measuring cylinder to measure very small capacities



we measure these in millilitres
we write this as ml

1000ml = 1l

- Organize groups of pupils and give them activities to do (for example **Activity 7.2.1, activity 7.2.2** and **activity 7.2.3**).
- Move around in the classroom and give assistance where necessary;
- Invite some groups to present and guide the whole class to harmonize on how to convert the units of capacity measurements.

d) Synthesis/summarization

Guide pupils to summarize the relation between capacity measurements, and how to convert from a unit to another using a conversion table.

Guide pupils to highlight how to convert compound units to a single unit.

e) Assessment

- Provide activities to be done by pupils (refer to application activity 7.2) and check their answers.
- Assign all pupils homework to be done.

f) Answer for activities

Activity 7.2.3

- a) 9 cl b) 80 l c) 7 l d) 6 l e) 5 dl f) 40 l

Application activity 7.2

- 1) a) 80dl c) 50ml e) 940cl.
 b) 70cl d) 920dl f) 390ml.
 2) a) 4 l c) 5680 ml e) 409 ml
 b) 13 l d) 350 cl f) 2009 ml

Lesson 4: Comparing capacity measurements

a) Objectives

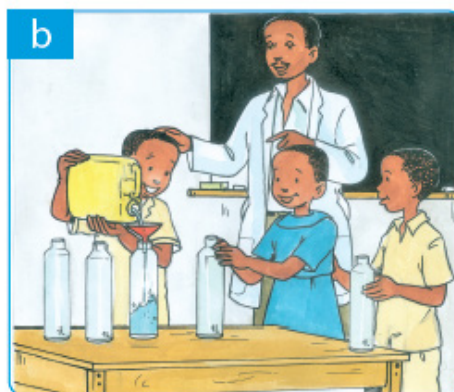
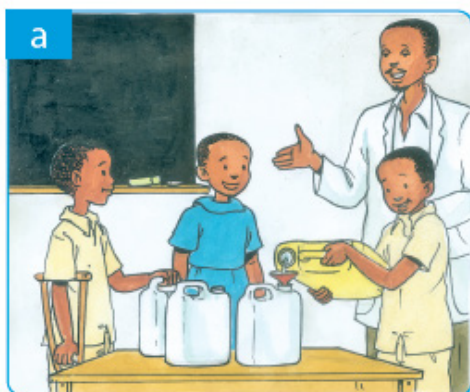
Compare capacity measurements

b) Teaching resources and learning resources

- Different bottles to be used when measuring the capacity of liquids in containers;
- Conversion table of capacity measurements.

c) Teaching and learning activities:

- Show pupils objects of different volume and ask them to compare their capacity before measuring (refer to **activity 7.3.1**). Which is bigger? Which is smaller?



- Invite one pupil in front of others and guide him/her on how to measure and record capacity of objects and then compare the obtained measurements using $<$, $>$ or $=$ (use **activity 7.3.2**);
- Organize groups of pupils and assign them to do **activity 7.3.3**
- Move around in the classroom and provide probing questions for assistance where necessary;
- Invite some groups to present and guide the whole class to harmonize on how to compare capacity of liquid containers.

d) Synthesis/summarization

- Guide pupils to summarize how to compare capacity of liquid containers: *use a conversion table to convert all capacities in the given smallest unit and then compare obtained values.*

e) Assessment

- Provide activities to be done by pupils (use the application activity 7.3) and check their answers;
- Assign all pupils homework to do.

f) Answer for activities

Activity 7.3.3

a) $807 \text{ cl} > 25 \text{ dl}$

c) $98 \text{ dl} > 9 \text{ l}$

e) $457 \text{ ml} < 45 \text{ dl}$

b) $67 \text{ dl} = 670 \text{ cl}$

d) $900 \text{ ml} = 9 \text{ dl}$

f) $593 \text{ cl} < 94 \text{ dl}$

Application activity 7.3

a) $8 \text{ 549 m l} > 85 \text{ dl}$

c) $307 \text{ ml} < 9 \text{ l}$

$890 \text{ ml} = 89 \text{ cl}$

b) $96 \text{ dl} = 960 \text{ cl}$

d) $987 \text{ cl} > 9 \text{ l } 7 \text{ cl}$

f) $12 \text{ l } 8 \text{ dl} > 129 \text{ cl}$

Lesson 6: Ordering capacity measurements

a) Objectives

Arrange capacity measurements

b) Teaching resources and learning resources

- Different bottles to be used when measuring the capacity of liquids in containers;
- Conversion table of capacity measurements.

c) Teaching and learning activities:

- Show pupils objects of different volume and ask them to arrange their capacity in a given order.
- Organize groups of pupils and assign them to do **activity 7.4.1**

First, I change the data in the smallest given unit of measure of capacity, and then arrange the data in a given order!

<i>l</i>	<i>dl</i>	<i>cl</i>	<i>ml</i>
6	9	0	
8	9	0	
4	6	5	

- Move around in the classroom and provide probing questions for assistance where necessary;
- Invite some groups to present and guide the whole class to arrange capacity measurements in ascending order.
- Assign the same groups to do **activity 7.4.2**
- Move around in the classroom and motivate pupils to share ideas;
- Invite some groups to present and guide the whole class to harmonize on how arrange capacity measurements in descending order.

d) Synthesis/summarization

- Guide pupils to summarize how to arrange capacity of liquid containers: *use a conversion table to convert all capacities in the given smallest unit and then arrange obtained values in the given order (ascending or descending).*

e) Assessment

- Provide activities to be done by pupils (use the application activity 7. 4) and check their answers;
- Assign all pupils homework to do.

f) Answer for activities

Activity 7.4.1

- | | |
|----------------------|--------------------|
| a) 597ml, 9dl, 9 l | c) 3cl, 57cl, 89dl |
| b) 9ml, 67dl, 792 cl | d) 8cl, 9dl, 5 l |

Activity 7.4.2

- | | |
|------------------------|-----------------------|
| a) 9 l, 21 dl, 935 ml | c) 64 dl, 2 l, 74 cl |
| b) 95 cl, 5 dl, 354 ml | d) 78 dl, 4 l, 987 ml |

Application activity 7.4

- | | |
|--------------------------|-------------------------|
| 1) a) 697ml, 849cl, 95dl | c) 879ml, 549cl, 87dl |
| b) 279ml, 897cl, 96dl | d) 647ml, 67dl, 748cl |
| 2) a) 95dl, 975ml, 48cl | c) 86dl, 7l, 958 ml |
| b) 875cl, 8 l, 49dl | d) 98dl, 971 cl, 624 ml |

Lesson 7: Addition of capacity measurements

a) Objectives

Add capacity measurements.

b) Teaching resources and learning resources

- Different bottles to be used when measuring the capacity of liquids in containers;
- Conversion table of capacity measurements.

c) Teaching and learning activities:

- Organize groups of pupils and assign them to do **activity 7.5.1**;
- Invite some groups to present and guide the whole class on how to add the capacity measurements;

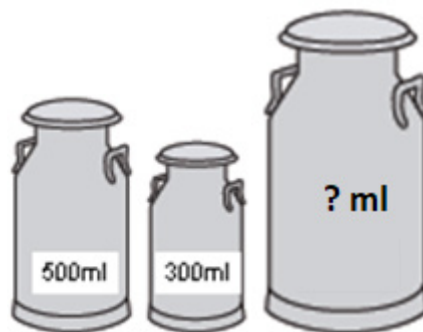
The 2 small containers of milk: 500mℓ and 300 mℓ.

The milk is put together in a big empty container.

Complete:

The total quantity of milk is

500 mℓ + 300 mℓ = ____



- Remind pupils how to convert the capacity measurements
- Assign the same groups to do **activity 7.5.2**;
- Move around in the classroom and give assistance where necessary;
- Invite some groups to present and harmonize their presentation
- Motivate pupils to do **activity 7.5.3**
- Help pupils to solve a one –step or a two-step of a problem:
- Guide them to understand the problem by identifying given and requested, and to draw visual representations and then solve the problem using the addition.
- Invite some groups to present and guide the whole class to harmonize their work.

d) Synthesis/summarization

- Guide pupils to summarize how to add capacity measurements: use a conversion table to convert in the requested unit and then add them using standard written method and identify facts before solving the problem.

e) Assessment

- Give activities to be done by pupils (refer to **application activity 7.5**) and check their answers.
- Assign homework to be done by all pupils.

f) Answers for activities

Activity 7.5.3

1. Number of litres of milk we get per day: $42 \ell + 4800 \text{ c}\ell = 90 \ell$

2. Number of litres of cooking oil he sold altogether:

$$450\text{d}\ell + 5500\text{c}\ell = 10 \ell$$

3. Quantity of water she uses every day:

$$75 \ell + 550 \text{ d}\ell = 130\ell$$

Application activity 7.5

1) a) $6 \ell + 7 \text{ d}\ell = 67\text{d}\ell$

b) $77 \text{ c}\ell + 30 \text{ m}\ell = 8\text{d}\ell$

c) $80 \text{ c}\ell + 32 \text{ d}\ell = 4 \ell$

d) $36 \text{ d}\ell + 40 \text{ c}\ell = 4\ell$

2) Quantity of water they used altogether: $200 \text{ d}\ell + 400\text{d}\ell = 60 \ell$

3) Number of litres of fuel sold in those two days: $658 \ell + 2\ 320 \text{ d}\ell = 890 \ell$.

Lesson 8: Subtraction of capacity measurements

a) Objectives

Subtract capacity measurements.

b) Teaching resources and learning resources

- Different bottles to be used when measuring the capacity of liquids in containers;
- Conversion table of capacity measurements.

c) Teaching and learning activities:

- Invite one pupil in front of others and guide him/her on how to demonstrate subtraction of capacity measurements starting by measuring liquids and take away some of them and see the capacity of remaining liquids (refer to **activity 7.6.1**);

From full milk container of 75 cℓ, I take away 25 cℓ. How many cl remaining in this big container?



- Organize groups of pupils and assign them to do **activity 7.6.2**;
- Move around in the classroom and give assistance where necessary;
- Invite some groups to present and guide the whole class to harmonize on how to carry out the subtraction involving capacity measurements.
- Assign the same groups to do **activity 7.6.3**
- Help pupils to solve a one –step or a two-step of a problem:
- Guide them to understand the problem by identifying given and requested, and to draw visual representations and then solve the problem involving subtraction.

- Invite some groups to present their findings and guide the whole class to moderate their work.

d) Synthesis/summarization

- Guide pupils to summarize how to subtract capacity measurements: use a conversion table to convert in the smallest unit or in the requested unit, and then subtract using standard written method.

e) Assessment

- Provide activities to be done by pupils (**application activity 7.6**) and check their answers.
- Assign homework to be done by all pupils.

f) Answer for activities

Activity 7.6.3

1) Number of cl of water that were remained: $20\ell - 169d\ell = 310c\ell$

2) Number of litres that were consumed by our visitors: $3\,000\,d\ell - 40\ell = 260\ell$

3) Number of litres of water I remained with: $60\ell - 375\,d\ell = 225d\ell$

Application activity 7.6

1. a) $4l - 98cl = 302cl$

b) $6dl - 6cl = 54cl$

c) $56cl - 5dl = 6cl$

d) $98ml - 6cl = 38ml$

2) Number of litres of water he needed to complete his task:
 $225\ell - 1750d\ell = 50\ell$

3) Number of litres of water we need: $145\ell - 950\,d\ell = 50\ell$

4) Number of litres he remained with: $750\,d\ell - 38\ell = 37\ell$.

Lesson 9: Multiplication of capacity measurements by a number

a) Objectives

Multiply capacity measurements by a number.



b) Teaching resources and learning resources

- 6 bottles full of water each containing $500m\ell$;
- Empty jerrycan or any other empty container that can hold at least 3ℓ (at minimum 3ℓ)
- Conversion table of capacity measurements.

c) Teaching and learning activities:

- Invite one pupil in front of others and ask him/her to pour 6 bottles of water one by one in jerrycan;
- Guide pupils when pouring water in jerrycan by indicating order of poured bottle (1st bottle, 2nd bottle, ..., 6th bottle)
- Ask other pupils to say the total capacity for them when they are put together in the jerry can.

The other example is the following:

	Milk to be poured in the big right milking cane.	Big milking cane
You buy 6 small milking can of 50 cl for each. If you pour it in your big milk container, what is the total quantity of milk?	 The total is $50\ell \times 6 = \underline{\quad}$	

- Assign pupils to do in **pair activity 7.7.1**
- Invite one pupil to present their findings and guide the whole class to harmonize on how to find a product of capacity measurement by a number.
- Organize groups of pupils and assign them to do **activity 7.7.2**;
- Move around in the classroom and provide probing questions for assistance where necessary;
- Invite some groups to present their findings and moderate their presentation for whole class.
- Assign the same groups to do **activity 7.7.3**
- Help pupils to solve a one –step or a two-step of a problem:
- Guide them to understand the problem by identifying given and requested, and drawing visual representations and then solve the problem involving multiplication.
- Invite some groups to present their findings and guide the whole class to moderate their work.

d) Synthesis/summarization

Guide pupils to summarize how to find a product of capacity measurement by a number: **convert the measurement in the smallest unit given, multiply the obtained value by the given number and copy that small unit then convert the result in the requested unit.**

e) Assessment

- Provide activities to be done by pupils (**application activity 7.7**) and check their answers.
- Assign homework to all pupils.

f) Answer for activities

Activity 7.7.3

- 1) Number of dl she fetched: $15 \text{ l} \times 4 = 600\text{dl}$
- 2) Number of litres of milk he has got in 5 day: $32 \text{ l} \times 5 = 160 \text{ l}$
- 3) Number of litres of milk do they consume altogether: $500 \text{ cl} \times 8 = 40 \text{ l}$
- 4) Number of litres of fuel does it consume in 6 days: $750 \text{ cl} \times 6 = 45 \text{ l}$

Application activity 7.7

1. a) $654\text{dl} \times 9 = 5886\text{dl}$ b) $565\text{cl} \times 8 = 452\text{dl}$
c) $185\text{l} \times 4 = 740\text{l}$ d) $125\text{dl} \times 8 = 100\text{l}$
- 2) Number of litres of water used by Uwingabire: $250 \text{ dl} \times 65 = 1625\text{l}$
- 3) Number of litres of water 9 pupils drink in 2 days: $(50 \text{ cl} \times 9) \times 2 \times 3 = 27\text{l}$

Lesson 10: Dividing a capacity measurement by a number

a) Objectives

Divide capacity measurements by a number.

b) Teaching resources and learning resources

- Different bottles to be used when measuring the capacity of liquids in containers;
- Conversion table of capacity measurements.

c) Teaching and learning activities:

- Invite one pupil in front of others and guide him/her on how to demonstrate the division a capacity measurement in a given number of quantities: jerrycan containing 4 liters of water to be shared equally among 8 small bottles and measure the quantity for one bottle in ml;

Another example is the following:

<p>Share equally one by one 4 000 mℓ of milk among your 8 friends.</p> <p>How many mℓ every one will get?</p>		 <p>The capacity of each one is: $4000\text{m}\ell \div 8 =$ ___ mℓ</p>
---	---	--

- Ask other pupils to say the capacity for water in one bottle (note that it is equal to $4 \ell \div 8 = 4\ 000\text{m}\ell \div 8 = 500 \text{ m}\ell$) (refer to activity 7.8.1);
- Organize groups of pupils and assign them to do **activity 7.8.2**;
- Move around in the classroom and provide probing questions for assistance where necessary;
- Invite some groups to present and guide the whole class to harmonize on how to divide a capacity measurement by a number.
- Assign the same groups to do **activity 7.8.3**
- Help pupils to solve a one –step or a two-step of a problem:
- Guide them to understand the problem by identifying given and requested and drawing visual representations and then solve the problem involving division.
- Invite some groups to present their findings and guide the whole class to moderate their work.

d) Synthesis/summarization

Guide pupils to summarize how to divide a capacity measurement by a whole number: convert the measurement in the requested unit, divide the obtained value by the given number and copy that unit.

e) Assessment

- Provide activities to be done by pupils (**application activity 7.8**) and check their answers.
- Assign homework to all pupils.

f) Answer for activities

Activity 7.8.3

- 1) Number of small jerry can of 5 l you can get: $500 \text{ dl} \div 50 \text{ dl} = 10$.
- 2) Number of litres you will give to each child: $800 \text{ cl} \div 8 = 100$.
- 3) Number of cl will you give to each family: $450 \text{ dl} \div 9 = 50 \text{ dl}$
- 4) Number of cl of cooking oil she uses per day: $400 \text{ cl} \div 8 = 50 \text{ cl}$.

Application activity 7.8)

1. a) $6960 \text{ m\ell} \div 6 = 1160 \text{ cl}$
b) $980 \text{ m\ell} \div 7 = 140 \text{ cl}$
c) $488 \text{ ml} \div 8 = 61 \text{ ml}$
d) $6390 \text{ m\ell} \div 9 = 710 \text{ cl}$
- 2) Number of litres you will give to each child: $900 \text{ cl} \div 9 = 100 \text{ cl}$
- 3) The share of each child: $56 \text{ dl} \div 7 = 8 \text{ dl}$

7.6. Ending points of the unit

a) Summary of the unit

Try to summarize the content for this unit.

b) Additional information for the teacher

- The teacher plays an important role in the learning activity, guide all learning situations and engage every pupil;
- Introduce the concept of capacity measurements by using concrete liquids measured using different bottles;
- Teach pupils different ways of measuring the capacity; use of non standard units and the use of standard units;
- Invite pupils to create stories from given number sentences involving capacity measurements, estimating capacity before measuring them.
- Pose to pupils, daily problems in the form of words, tables and pictorials.

c) Answers for the end unit assessment 7

- 1) a) 40 dl b) 6 500 ml c) 75 dl d) 779 cl
- 2) a) 79 dl < 7 908 ml c) 9 l > 79 dl
b) 27 dl > 16 cl d) 546 cl < 7 l
- 3) 3006ml, 707cl, 75dl
- 4) 75 dl, 7 l, 3 dl, 3cl 6 ml 915cl, 46dl, 234ml
- 5) a) 8 177 ml b) 3l c) 4817ml d) 9 900 ml

- 6) Number of litres of cooking oil used in 8 days: $225 \text{ cl} \times 8 = 18 \text{ l}$
- 7) Number of litres of water did we poured altogether: $67 \text{ l} + 1330 \text{ dl} = 200 \text{ l}$
- 9) The share of each car in litres: $7500 \text{ cl} \div 5 = 15 \text{ l}$
- 10) Number of cl of milk do they drink per day: $850 \text{ ml} \times 5 = 425 \text{ cl}$

d) Remedial activities

1) Convert following measurements

- a) $9 \text{ l } 9 \text{ cl} = \dots \text{ ml}$ b) $28 \text{ dl} = \dots \text{ cl}$ c) $8 \text{ dl } 6 \text{ ml} = \dots \text{ ml}$

2) Arrange the following in ascending order

4 l, 76 dl, 98 cl, 673 ml

3) Arrange the following in descending order

978 cl, 7456 ml, 98 dl, 9 l

4) Use $>$, $<$ or $=$ to compare these measurements:

- a) $987 \text{ ml} \dots 9 \text{ dl } 8 \text{ ml}$ b) $79 \text{ dl} \dots 856 \text{ cl}$
 c) $615 \text{ ml} \dots 6 \text{ dl } 15 \text{ ml}$

5) work out

- a) $700 \text{ ml} + 3 \text{ dl} = \dots \text{ l}$ c) $25 \text{ cl} \times 4 = \dots \text{ l}$
 b) $48 \text{ l} - 376 \text{ dl} = \dots \text{ cl}$ d) $450 \text{ dl} : 9 = \dots \text{ l}$

6) Solve these problems:

- a) In the morning, Gatoni fetched 15 litres of water, afternoon she fetched 100 dl of water and in evening she fetched 1200 cl of water. How much water did Gatoni fetch on that day?
- b) Bahati has 225 litres of water. If he uses 1987 dl when making bricks, how much water will remain?
- c) Imena used a 10 litres jerry can to fetch water. If he bought it 10 times, how much water did he fetch?
- d) Share equally 225 litres of cooking oil among 5 families. How much oil will each family get?

e) Extension activities

1) Convert following measurements

- a) $97 \text{ dl } 78 \text{ ml} = \dots \text{ ml}$ b) $4 \text{ l } 9 \text{ cl} = \dots \text{ ml}$ c) $9 \text{ l } 49 \text{ cl} = \dots \text{ cl}$

2) Arrange the following in ascending order

79 dl, 8 l, 978cl, 7589 ml

3) Arrange the following in descending order

ml 758, dl 79, l 9, cl 687

4) Use $>$, $<$ or $=$ to compare these measurements:

a) 4 l 456 ml 456 ml

b) 978 cl758dl

c) 57dl 9 ml..... 5709 ml

5) Work out:

a) $6540 \text{ ml} + 46 \text{ cl} = \dots \text{ l}$

c) $897 \text{ dl} \times 8 = \dots \text{ dl}$

b) $56 \text{ dl} - 2600 \text{ ml} = \dots \text{ cl}$

d) $6384 \text{ cl} : 8 = \dots \text{ cl}$

6) Solve these problems:

a) In the preparation of marriage ceremonies of my sister we used water in the following ways: the first day we used 676 litres, the second day we used 256 litres. Find the amount of water we used in the two days.

b) Uwamahoro poured 4678 dl of water from a water tank that 500 litres. Determine the quantity of water that remained in the tank.

c) Mugisha was fetching water with the use of a jerry can of 20 litres. If he fetched 19 times, how much water did Mugisha fetch?

d) Pour 975 litres of juice into 5 litres bottles each. How many bottles will you use?

UNIT 8

RWANDAN CURRENCY FROM 1 Frw UP TO 5000 Frw

8.1. Key unit competence

Use appropriately Rwandan currency from 1 Frw up to 5000 Frw

8.2. Prerequisite

Pupils will easily learn this unit, if they have a good background on counting and exchanging money up to 1000Frw learnt in P2. Represent the value of money in coins and notes.

8.3. Cross-cutting issues to be addressed

- **Standardization Culture:** While using correctly Rwandan currency respecting the value of money and well maintaining the status of Rwandan francs.
- **Financial Education:** when a child knows the value of money, he/she will never misuse it but will save and protect it .
- **Gender balance:** provide equal opportunity to boys and girls in the lesson
- **Inclusive education:** promote education for all learners in the teaching and learning activities.
- **Peace and values education:** addressed when pupils are encouraged to work collaboratively and peacefully in their group.

8.4. Sub-headings / List of lesson

UNIT 8: RWANDAN FRANCS FROM 1 Frw UP TO 5000 Frw (16 periods)			Reinforcement and Extension	
	Lesson title	Learning objectives	Number of periods	
1	Introductory activity	Arouse the curiosity of learners on the importance, characteristics and the management of money.	1	
2	Characteristics and values of Rwandan francs from 1 Frw up to 5000Frw	Observe the given Rwandan currency and answer related questions: Sequence of coins of 1Frw, 5Frw, 10Frw, 20Frw, 50Frw, 100Frw and notes of 500 Frw and 1000 Frw, 2000Frw and 5000Frw.	1	

3	Changing Rwandan francs from 1 Frw up to 5000 Frw	Change the Rwandan francs from 1Frw up to 5000Frw.	1	1
4	Word problems involving addition of Rwandan francs from 1 Frw up to 5000 Frw	Solve word problems involving addition of Rwandan francs from 1 Frw up to 5000 Frw.	1	1
5	Word problems involving subtraction of Rwandan francs from 1 Frw up to 5000 Frw	Solve word problems involving subtraction of Rwandan francs from 1 Frw up to 5000 Frw.	1	
6	Remediation	Provide learning support to learners who are falling behind their peers	1	
7	Word problems involving multiplication of Rwandan francs from 1 Frw up to 5000Frw	Solve word problems involving multiplication of Rwandan francs from 1 Frw up to 5000Frw.	1	1
8	Word problems involving division of Rwandan francs from 1 Frw up to 5000 Frw by a whole number	Solve word problems involving division of Rwandan francs from 1 Frw up to 5000 Frw by a whole number.	1	
9	Buying and selling	Buy and sell goods.	1	1
10	Saving and small income generating projects	Save and list small income generating projects.	1	
11	End unit assessment	Be able to use appropriately Rwandan francs from 1 Frw up to 5000 Frw.	1	
12	Remediation	Provide learning support to learners who are falling behind their peers	1	
	Total		12	4

8.5. Guidance on different lessons for unit 8

Lesson 1: Guidance on introductory activity 8

- Invite pupils to read the story of Kanani who does not know to differentiate the types of Rwandan francs and their values;
- Guide pupils to discuss the reason one can fail to determine the money exchange;
- Ask them to suggest what is required for every one of them to be able to determine the money exchange in any situation;
- Move around in the classroom to get aware of different suggestions and ask some probing questions where necessary.
- Invite all pupils to a whole class discussion and basing on their experience, prior knowledge and abilities shown in answering questions for this activity, open a discussion with probing questions to guide them to give their predictions and ensure that you arouse their curiosity on what is going to be learnt in this unit so that they may be able to well manage money.

Lesson 2: Characteristics and values of Rwandan francs from 1 Frw up to 5000 Frw

a) Objectives

Observe the given Rwandan francs and say its characteristic.

b) Teaching resources and learning resources

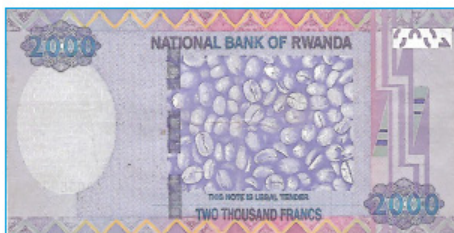
Different coins and notes used in Rwandan francs up to 5000Frw;

c) Teaching and learning activities:

- Invite pupils to observe coins and notes used in Rwandan francs and explain instructions on activities to be done (use activity 8.1);



- Guide them how to discover the characteristics of coins as it was done in P2;
- Form groups of pupils and give them coins and notes used in Rwandan francs not greater than 5000Frw.



- Ask them to describe each of them: the value, the color, matter in which it is made;
- Ask some groups to present the findings and guide the whole class to harmonize the core characteristics of each coin and each note used in Rwanda.

d) Synthesis/summarization

Guide pupils to summarize the core characteristics of each coin and note.

e) Assessment

Provide activities to pupils from the pupil's book (application activity 8.1).

Lesson 3: Changing Rwandan currency from 1 Frw up to 5000 Frw

a) Objectives

Change the Rwandan currency from 1Frw up to 5000Frw.

b) Teaching resources and learning resources

Different coins and notes used in Rwandan francs up to 5000Frw;

c) Teaching and learning activities

Activities to do (for example Activity 8.2.1 and activity 8.2.2).

Munezero receives 3 notes of 1000 Frw each and 2 notes of 500 Frw each as salary. How much money does Munezero receive?



- Move around in the classroom and provide probing questions for assistance where necessary;
- Invite some groups to present and guide the whole class to harmonize on how to combine notes and coins to represent a given amount of money
- You can put coins and notes in a basket and give a child an amount of money and ask him to go to change it using a combination of other coins and notes.

d) Synthesis/summarization

Guide pupils to summarize how to combine notes and coins to represent a given amount of money.

e) Assessment

- Provide activities to be done by pupils (application activity 8.2) and check their answers.
- Assign all pupils a homework to be done.

f) Answer for activities

Answer for activity 8.2.1

- 1) a) $1\ 000\ \text{Frw} = 500\ \text{Frw} + 500\ \text{Frw}$
b) $2\ 000\ \text{Frw} = 1\ 000\ \text{Frw} + 1000\ \text{Frw}$
c) $5\ 000\ \text{Frw} = 2000\text{frw} + 2000\text{frw} + 1000\text{frw}$
e) $5000\text{frw} = 2000\text{frw} + 1000\text{frw} + 1000\text{frw} + 1000\text{frw}$

- 2) a) $2\ 000\ \text{Frw} = 1\ 000\ \text{Frw} + 1\ 000\ \text{Frw}$
 b) $2000\text{frw} = 1000\text{frw} + 500\text{frw} + 500\text{frw}$
 c) $1\ 000\ \text{Frw} = 500\ \text{Frw} + 500\ \text{Frw}$
 d) $5\ 000\ \text{Frw} = 500\ \text{Frw} + 500\ \text{Frw} + 500\ \text{Frw} + 500\ \text{Frw} + 500\ \text{Frw} + 500\ \text{Frw} + 500\ \text{Frw} + 500\ \text{Frw} + 500\ \text{Frw} + 500\ \text{Frw}$
 e) $500\ \text{Frw} = 100\ \text{Frw} + 100\ \text{Frw} + 100\ \text{Frw} + 100\ \text{Frw} + 100\ \text{Frw}$
- 3) a) $3\ 000\ \text{Frw} = 1\ 000\ \text{Frw} + 1\ 000\ \text{Frw} + 1\ 000\ \text{Frw}$.
 b) $4\ 000\ \text{Frw} = 2\ 000\ \text{Frw} + 1\ 000\ \text{Frw} + 500\ \text{Frw} + 500\ \text{Frw}$.
 c) $2\ 000\ \text{Frw} = 1\ 000\ \text{Frw} + 500\ \text{Frw} + 500\ \text{Frw}$.

Lesson 4: Word problems involving addition of Rwandan currency from 1 Frw up to 5000 Frw

a) Objectives

Solve problems involving addition of Rwandan currency.

b) Teaching resources and learning resources

- Different coins and notes used in Rwandan francs up to 5000Frw;
- Different scenarios involving the need for adding money.

c) Teaching and learning activities:

- Explain a scenario involving the need for adding money and ask some pupils to come in front of others to explain how to solve it and guide them to demonstrate the addition of money using the standard written method;
- Organize groups of pupils and give them activities to do: use solved example of **Activity 8.3**.
- Assign pupils to work in groups and solve word problem of **Activity 8.3**.
- Move around in the classroom and provide probing questions for assistance where necessary;
- Invite some groups to present and guide the whole class to harmonize on how to add money.

d) Synthesis/summarization

- Guide pupils to summarize when and how to add money: using the standard written method.

e) Assessment

- Provide activities to be done by pupils (application activity 8.3) and check their answers.
- Assign homework to be done by all pupils.

Note:

When the question is given as a word problem, try to guide them to respect the main steps for problem solving seen above.

f) Answers for activities

Answers for activity 8.3

- 1) He paid: $1500\text{Frw} + 500\text{ Frw} = 2\ 000\text{ Frw}$.
- 2) He paid altogether: $3\ 500\text{ Frw} + 900\text{ Frw} = 4\ 400\text{ Frw}$
- 3) The money he gave them altogether:
 $750\text{ Frw} + 1\ 450\text{ Frw} + 1\ 150\text{ Frw} + 950\text{ Frw} = 4\ 300\text{ Frw}$
- 4) The money he bought the whole gift:
 $1\ 500\text{ Frw} + 500\text{ Frw} + 2\ 000\text{ Frw} + 1000\text{ Frw} = 5000\text{ Frw}$.

Answers for application activity 8.3

- 1) Their total cost is $3\ 470\text{Frw}$;
- 2) The money she paid: $1\ 200\text{ Frw} + 500\text{ Frw} + 800\text{ Frw} = 2\ 500\text{ Frw}$;
- 3) The money they promises us: $3400\text{ F} + 1300\text{Frw} = 4\ 700\text{ Frw}$.

Lesson 5: Word problems involving subtraction of Rwandan currency from 1 Frw up to 5000 Frw

a) Objectives

Solve word problems involving subtraction of Rwandan currency.

b) Teaching resources and learning resources

- Different coins and notes used in Rwandan francs up to 5000Frw;
- Different scenarios involving the need for subtraction of money.

c) Teaching and learning activities:

- Explain a scenario involving the need for making a difference of money and ask some pupils to come in front of others to explain how to solve it and guide them to demonstrate the subtraction of money using the standard written method; Use the solved example of **Activity 8.4**

- Organize groups of pupils and give them activities to do (**Activity 8.4**);
- Move around in the classroom and provide probing questions for assistance where necessary;
- Invite some groups to present and guide the whole class to harmonize on how to subtract (make a difference of) money.

d) Synthesis/summarization

Guide pupils to summarize when and how to make a difference of money: using the standard written method.

e) Assessment

- Provide activities to be done by pupils (application activity 8.4) and check their answers.
- Assign homework to be done by all pupils.

Note: When the question is given as a word problem, try to guide them to respect the main steps for problem solving as it was seen in previous units.

a) Answers for activities

Answers for the activity 8.4

- 1) The balance became: $1000\text{Frw} - 850\text{Frw} = 150\text{Frw}$
- 2) To buy the trouser, she needs: $5000\text{Frw} - 4500\text{Frw} = 500\text{Frw}$
- 3) The money Kaneza bought that bucket: $4\ 100\text{Frw}$
- 4) The money I remained with: $4\ 500\text{Frw} - 3\ 900\text{Frw} = 600\text{Frw}$

Answers for application activity 8.4

- 1) The balance is: $5\ 000\ \text{Frw} - 3750\ \text{Frw} = 1\ 250\ \text{Frw}$
- 2) The money I remained with: $5\ 000\ \text{Frw} - 3900\ \text{Frw} = 1\ 100\ \text{Frw}$.

Lesson 6: Word problems involving multiplication of Rwandan currency from 1 Frw up to 5000 Frw by a whole number

a) Objectives

Solve word problems involving multiplication of Rwandan currency.

b) Teaching resources and learning resources

- Different coins and notes used in Rwandan francs up to 5000Frw;
- Different scenarios involving the need for finding the total amount of money for people who have equal amount of money.

c) Teaching and learning activities:

- Explain a scenario involving the need for finding the total amount of money for people for example 4 pupils who have equal amount of 100; use the solved example of **Activity 8.5**
- Ask them to find that total money and invite one pupil in front of others and guide him/her to demonstrate the solution involving multiplication of such money a number; they will see that it is equal two $100\text{Frw} + 100\text{Frw} + 100\text{Frw} + 100\text{Frw} = 100 \text{ Frw} \times 4 = 400\text{Frw}$.
- Organize groups of pupils and give them activities to do (for example Activity 8.5);
- Move around in the classroom and provide probing questions for assistance where necessary;
- Invite some groups to present and guide the whole class to harmonize on how to find a product of money by a number.

d) Synthesis/summarization

Guide pupils to summarize how to find a product of money by a number: **use the standard written method and copy the unity of money which is Frw.**

e) Assessment

- Provide activities to be done by pupils (application activity 8.5) and check their answers.
- Assign homework to all pupils.

Note: When the question is given as a word problem, try to guide them to respect the main steps for problem solving as it was seen in previous units.

f) Answers for activities

Answer for activity 8.5

- 1) a) 4 800 Frw b) 3 600 Frw c) 4 000 Frw d) 5 000 Frw e) 5 000frw
- 2) $85 \text{ Frw} \times 27 = 2\,295\text{Frw}$
- 3) $80 \text{ Frw} \times 119 = 9\,520\text{Frw}$
- 4) $250 \text{ Frw} \times 8 = 2\,000 \text{ Frw}$
- 5) $(1\,400 \text{ Frw} \times 3) - 800 \text{ Frw} = 3\,400 \text{ Frw}$

Answer for application activity 8.5

1) 9 600 Frw

2) 4 800 Frw

3) 9000 Frw

Lesson 6: Word problems involving division of Rwandan currency from 1 Frw up to 5000 Frw by a whole number

a) Objectives

Solve word problems involving division of Rwandan currency by a whole number.

b) Teaching resources and learning resources

- Different coins and notes used in Rwandan francs up to 5000Frw;
- Different scenarios involving the need for finding the money taken by one person when a given number of people share equally an amount of money.

c) Teaching and learning activities:

- Explain a scenario involving the need for finding the money for one pupil for example when 4 pupils share equally 1000Frw;
- Ask them to find the part for one pupil and invite one pupil in front of others and guide him/her to demonstrate how to find the answer by dividing such money by 4; they will see that it is equal two $1000\text{Frw} \div 4 = 250 \text{ Frw}$.
- Organize groups of pupils and give them activities to do (for example Activity 8.6);
- Move around in the classroom and provide probing questions for assistance where necessary;
- Invite some groups to present and guide the whole class to harmonize on how to find a quotient of money by a number.

d) Synthesis/summarization

Guide pupils to summarize how to divide an amount of money by a number: **use the standard written method for division and copy the unity of money which is Frw.**

e) Assessment

- Provide activities to be done by pupils (application activity 8.6) and check their answers.
- Assign homework to all pupils.

Note: When the question is given as a word problem, try to guide them to respect the main steps for problem solving as it was seen in previous units.

Lesson 7: Buying and selling

a) Objectives

Role play the buying and selling of goods.

b) Teaching resources and learning resources

- Different coins and notes used in Rwandan francs up to 5000Frw;
- Pictorials of coins and notes and toy money;
- Different scenarios involving the need for buying and selling.

c) Teaching and learning activities:

- Organize a scenario for buying and selling:
- There is a table having different commodities whose prices are labeled on,
- Role-play the seller, who will receive money and give the balance where possible,
- Pupils will come with a given amount of money and a list of commodities to be bought and the seller will give back the balance when necessary.
- Organize groups of pupils and give them activities to do (for example Activity 8.7.1);
- Move around in the classroom and provide probing questions for assistance where necessary;
- Invite some groups to present and guide the whole class to harmonize on how to buy merchandises.

d) Synthesis/summarization

Guide pupils to summarize how to plan what one can buy depending on the money he/she has.

e) Assessment

- Provide activities to be done by pupils (application activity 8.7) and check their answers.
- Assign homework to all pupils.

f) Answers for application activity 8.7.1

- 1) $800 \text{ Frw} \times 5 = 4\,000 \text{ Frw}$
- 2) $(488 \text{ Frw} \times 3) + 1\,200 \text{ Frw} = 2\,664 \text{ Frw}$
- 3) $(1\,200 \text{ Frw} \times 2) + (4 \times 500 \text{ Frw}) = 4\,400 \text{ Frw}$
- 4) $2000 \text{ Frw} + (4 \times 500 \text{ Frw}) + 1\,000 \text{ Frw} = 5\,500 \text{ Frw}$
- 5) $(800 \text{ Frw} \times 3) + 1\,200 \text{ Frw} + 1\,200 \text{ Frw} = 4\,800 \text{ Frw}$

Lesson 8: Saving and Small income generating projects

a) Objectives

Explain how one can Save and list small income generating projects:

b) Teaching resources and learning resources:

- Different stories or scenarios related to income generating projects.
- A small income generating project around the school to be visited.

c) Teaching and learning activities:

- Prepare a scenario in which pupils discuss the importance of saving and small income generating project and different ways of creating some of them.
- Guide pupils to read stories on saving and small income generating projects. Use **Activity 8.8.1, activity 8.8.2 and activity 8.8.3.**
- Guide them to discuss lessons learnt from the stories and different ways of saving and making small income generating projects.
- Organize groups of pupils and give them activities to do;
- Move around in the classroom and provide probing questions for assistance where necessary;
- Invite some groups to present and guide the whole class to harmonize different ways of making small income generating projects.

d) Synthesis/summarization

Guide pupils to summarize different ways of making small income generating projects and what they will do to create their own projects.

e) Assessment

- Provide activities to be done by pupils and check their answers. Use **application activity 8.8.**
- Assign homework to all pupils.

f) Answers for the end unit assessment 8

1) a) 5 000 Frw = 2 000 Frw + 2 000 Frw + 2 notes of 500 Frw

b) 2 000 Frw = (100 Frw ×10) + 1 000 Frw

2) a) 2500 Frw

b) She needs 2 400 Frw

c) 5 000 Frw

d) 2 500 Frw

3) Each worker will get 1 200 Frw

4) She needs 1500 Frw.

g) Remedial activities

- 1) Complete with the amount of money
 - a) 5 000 Frw = ... Frw + Frw,
 - b) 2 000 Frw = Frw + Frw
 - c) 1 000 Frw = ... Frw + ... Frw
 - d) 5 000 Frw = Frw + Frw.
- 2) Makuza went to the shop with 2 000 Frw. He bought tomatoes at 500 Frw, a packet of tea leaves at 200Frw and the rice of 1000 Frw. How much money did he pay? What is the change he brought home.
- 3) Share 500Frw equally among 5 children. How much will every child get?
- 4) Munezero bought 2kg of sugar on 1200 Frw per 1kg. He bought also 2 kg of rice on 1000Frw per one kg. How much money did Munezero pay? If he had one note of 5000Frw, How much did he bring as a balance?
- 5) Masabo bought 4 pens on 100Frw per one pen. He bought also 5 notebooks where each one costs 200Frw. If he had one note of 2000Frw, How much did he bring as a balance?

h) Extension activities

- 1) Complete with the amount of money
 - a) 5 000 Frw = ... Frw + ... Frw + ...Frw
 - b) 2 000 Frw = ... Frw + ... Frw + ... Frw.
 - c) 1 000 Frw = ... Frw + Frw
 - d) 5 000 Frw = ... Frw +... Frw +... Frw + ... Frw
- 2) Muhoza wet to the shop with 5 000 Frw. He bought meat of 3500Frw, sweet pepper of 500Frw and the rice of 800Frw. How much did Muhoza pay? What was the balance?
- 3) Share 8000Frw equally among 4 workers. How much will each work get?
- 4) Kaneza bought 5kg of sugar on 1200 Frw per 1kg. He bought also 3 kg of rice on 1000Frw per one kg. How much money did Munezero pay? How much did he pay? If he had 10 000Frw, how much did he bring as a balance?
- 5) I had 10 000Frw and I went to buy the following:
 - a) 2 litres of milk on 400Frw per one litre
 - b) One litre of cooking oil on 18000Frw
 - c) 2kg of beans on 7000frw per 1 kg;
 - d) 2kg of rice on 1200Frw per 1kg.
 - e) 2kg of sugar on 1200Frw per 1kg.
 - f) 2kg of irish potatoes on 300Frw per 1 kg.How much did I pay? How much did I remain with?

UNIT 9

TIME MEASUREMENTS

9.1. Key unit competence:

Reading and writing the time: the hour o'clock, a half past, a quarter past and a quarter to an hour and using a calendar to read days of each months or months of a year.

9.2. Prerequisite

Pupils will easily learn this unit, if they have a good background on how to read the hour, and days of a month learnt in P2.

9.3. Cross-cutting issues to be addressed

- **Standardization Culture:** Pupils can discover a watch that is not well set on time and start to set it correctly..
- **Financial Education:** when children know **to use** time appropriately, they can also sensitize the population about the time management.
- **Gender balance:** provide equal opportunity to boys and girls in the lesson
- **Inclusive education:** promote education for all learners in the teaching and learning activities.
- **Peace and values education:** addressed when pupils are encouraged to work collaboratively and peacefully in their group.

9.4. Sub-headings /list of lessons

UNIT 9: TIME MEASUREMENTS (24 periods)				Reinforcement and Extension
	Lesson title	Learning objectives	Number of periods	
1	Introductory activity	Arouse the curiosity of learners on the importance of reading, telling and writing time measurements.	1	
2	Reading, telling and writing an hour O'clock / Exact time	Read, tell and write an hour O'clock / Exact time.	2	1

3	Reading, telling and writing half past or thirty minutes past an hour	Read, tell and write half past or thirty minutes past an hour.	2	
4	Remediation	Provide learning support to learners who are falling behind their peers	1	
5	Reading, telling and writing quarter past or fifteen minutes past an hour	Read, tell and write quarter past or fifteen minutes past an hour.	1	1
6	Reading, telling and writing a quarter to an hour	Read, tell and write a quarter to an hour.	2	1
7	Use of a calendar	Be able to appropriately use calendar.	2	
	Remediation	Provide learning support to learners who are falling behind their peers	1	
8	Converting days into hours	Convert days into hours.	1	1
9	Converting weeks into days	Convert weeks into days.	1	
10	Converting years into months	Convert years into months.	1	
11	Ordinary year and leap year	Be able to distinguish an ordinary year from a leap year.	1	1
12	Planning daily, weekly and monthly activities	Prepare a daily, weekly and monthly activities plan.	1	
	End unit assessment	Reading and writing the time: the hour o'clock, a half past, a quarter past and a quarter to an hour and using a calendar to read days of each months or months of a year.	1	
	Total		18	6

9.5. Guidance on different lessons for unit 9

Lesson 1: Guidance on introductory activity

- Invite pupils to read the story of Gapasi who does not know to consider the time in everything he does.
- Guide pupils to discuss the reason one can fail to read and calculate the time;
- Ask them to suggest what is required for every one of them to be able to consider the time when doing different activities;
- Move around in the classroom to get aware of different suggestions and ask some probing questions where necessary.
- Invite all pupils to a whole class discussion and basing on their experience, prior knowledge and abilities shown in answering questions for this activity, open a discussion with probing questions to guide them to give their predictions and ensure that you arouse their curiosity on what is going to be learnt in this unit so that they may be able to manage the time effectively.

Lesson 2: Reading, telling and writing an hour O'clock

a) Objectives

Read, tell and write an hour O'clock / Exact time

b) Teaching resources and learning resources

- Different real clock faces and digital watches;
- Toys for clock faces with minute hand and hour hand.
- Manila paper with drawings showing clock faces which indicate different times (hour o' clock).

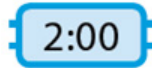
c) Teaching and learning activities:

- Invite pupils to observe clock faces indicating hours o'clock and explain instructions on activities to be done (use **activity 9.1.1**);
- Use different probing questions to guide them to discover how to read, to tell and how to write the time indicated by a watch showing hour o'clock: use a digital watch (with numbers only) and an analogue watch (with numerals, hour hand and minute hand).

Example:



It is **two o'clock**.



- Form groups of pupils and give them watch showing hours o'clock and ask them to read, tell to each other and write the time indicated: use other activities for discussion; they can be given the clock face on which they form and read the time;
- Ask some groups to present the findings and guide the whole class to harmonize how to read, tell and write the time related to an hour o'clock.
- You can write a time on the chalk board and ask pupils to draw a clock face which shows that time. Pupils can also move the minutes and hour hands of a toy for clock face to indicate that time.

d) Synthesis/summarization

Guide pupils to summarize how to read, tell and write the time related to an hour o'clock. For **example**:

Three o'clock: the minute hand reaches 12 while the hour hand points the number 3.

e) Assessment

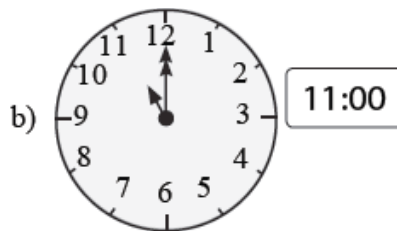
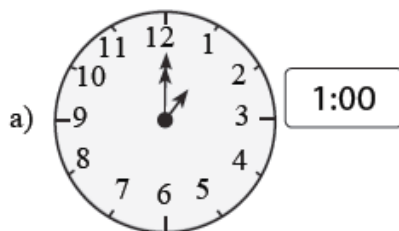
Provide activities to pupils from the pupil's book
(Use for example the **application activity 9.1.1**).

f) Answers for activities

Answers for activity 9.1.1

1) a) Seven o'clock c)) Seven o'clock b) Eight o'clock d) Eight o'clock

3)



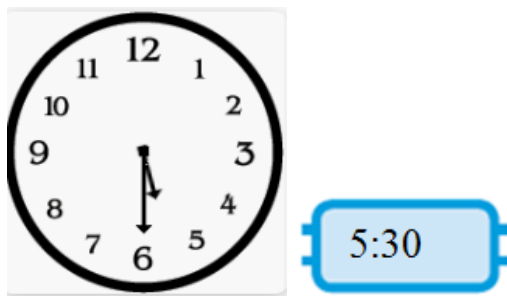
Answers for application activity 9.1.1

- a) Two o'clock c) Two o'clock
b) Three o'clock d) Three o'clock

Lesson 3: Reading, telling and writing a half past or thirty minutes past an hour

- This lesson is taught like the previous lesson but for this you will use:
- Toys for clock faces with minute hand and hour hand.
- Manila paper with drawings showing clock faces which indicate different times related to **half past an hour or thirty minutes past an hour**. It will be guided by activity 9.1.2.

Example:



It is **a half past five**

Or It is **thirty minutes past five.**

• Synthesis/summarization

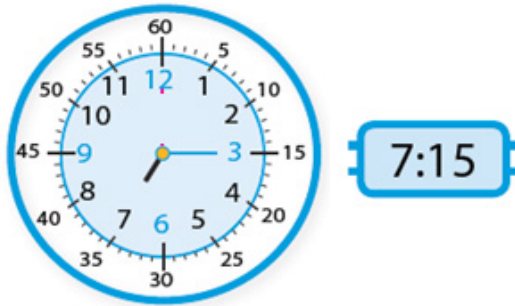
Guide pupils to summarize how to read, tell and write the time related to **half past an hour or thirty minutes past an hour**. In this case, the minute hand reaches the number 6 and the short hand (hour hand) will then point between two numbers. The hour to be said is the running hour.

- **Answers for activities:** Find the answers for the above mentioned activities and mark pupils' findings accordingly.

Lesson 4: Reading, telling and writing a quarter past an hour or fifteen minutes past an hour

- This lesson is taught like the previous lesson but for this you will use:
 - Toys for clock faces with minute hand and hour hand.
 - Manila paper with drawings showing clock faces which indicate different times related to a quarter past an hour or fifteen minutes past an hour. It will be guided by **activity 9.1.4** and **application activity 9.1.4**.

Example:



It is **fifteen minutes past seven**

Or it is **a quarter past seven.**

- **Synthesis/summarization**

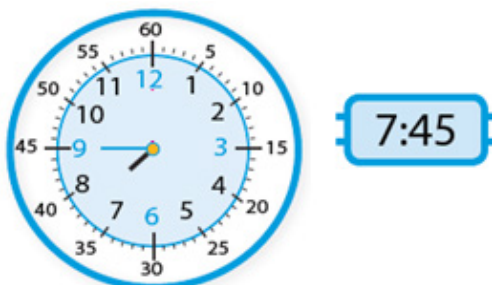
Guide pupils to summarize how to read, tell and write the time related to a quarter past an hour or fifteen minutes past an hour. In this case, the minute hand reaches the number 3 and the short hand (hour hand) will then point between two numbers. The hour to be said is the running hour.

- **Answers for activities:** Find the answers for the above mentioned activities and mark pupils' findings accordingly.

Lesson 5: Reading, telling and writing a quarter to an hour or fifteen minutes to an hour

- This lesson is taught like the previous lesson but for this you will use:
 - Toys for clock faces with minute hand and hour hand.
 - Manila paper with drawings showing clock faces which indicate different times related to a quarter to an hour or fifteen minutes to an hour. It will be guided by **activity 9.1.5** and **application activity 9.1.5**.

Example:



It is **fifteen minutes to eight.**

Or It is **a quarter to eight.**

- **Synthesis/summarization**

Guide pupils to summarize how to read, tell and write the time related to a quarter to an hour or fifteen minutes to an hour. In this case, the minute hand reaches the number 9 and the short hand (hour hand) will then point between two numbers. The hour to be said is the next hour.

- **Answers for activities:** Find the answers for the above mentioned activities and mark pupils' findings accordingly.

Lesson 6: Reading, telling and writing the time

- This lesson is taught like the previous lesson but for this lesson you will use:
- Toys for **different** clock faces with minute hand and hour hand.
- Manila paper with drawings showing clock faces which indicate different times related to a quarter to an hour or fifteen minutes to an hour. It will be guided by **activity 9.1.6** and **application activity 9.1.6**.

- **Synthesis/summarization**

Guide pupils to summarize how to read, tell and write any the time.

- **Answers for activities:**

Find the answers for the above mentioned activities and mark pupils' findings accordingly.

Lesson 7: Use of a calendar

a) Objective

Use appropriately the calendar

b) Teaching resources and learning resources

- Calendars of different years;
- Manila paper with drawings showing days in tables where pupils can complete dates for a given year when a reference day with its date is given.

c) Teaching and learning activities:

- Invite pupils to observe a calendar, describe it by telling: months of the year, weeks of months and days of weeks (use **activity 9.3.1**);
- Use different probing questions to guide them to discover how to read, to tell and how to make a calendar for the week, month and the year.
- Form groups of pupils and give them activities to be done, refer to **activity 9.3.2** for discussion;

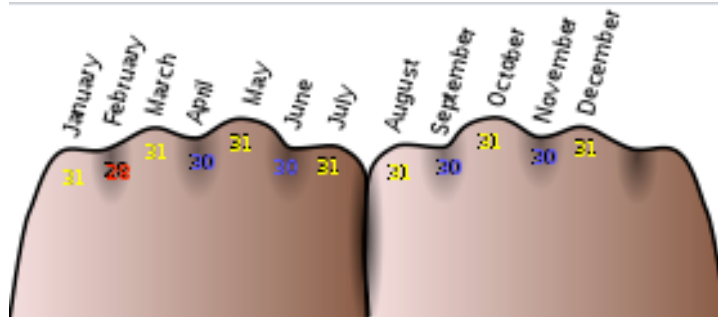
- Ask some groups to present the findings and guide the whole class to harmonize how to read, to tell and how to make a calendar for the year.
- Guide pupils to recognize that there exist years with 365 days and years with 366 days.

d) Synthesis/summarization

- Guide pupils to summarize how to make a calendar for the year: given the reference day and its date in the given month, put it on the calendar for its month and complete others accordingly.

Example: you can tell them that on 11/02/2023 it was Saturday. Make the full calendar for the year 2023.

- Guide learners to determine the number of days for all months by using their hands: One form of the mnemonic is done by counting on the knuckles of one's hand to remember the number of days in each month.



e) Assessment

Provide activities to be done by pupils.

Lesson 8: Converting units of time

a) Objectives

- Convert years into months.
- Convert weeks into days.
- Convert days to hours.
- Determine how old person is given the year of his birth.

b) Teaching resources and learning resources

- Manila paper on which there is a relationship between different units of time;
- Hand outs with different activities to be done by pupils.

c) Teaching and learning activities:

Note: This lesson can be taught in 3 different lessons: Converting days into hours, converting weeks into days, converting years into days and the lesson on the determination of how old a person is given the year of his birth.

In general, You can do it as follows:

- Invite all pupils in a whole class discussion to discuss relationship between different units of time and establish how to convert from a unit of time to another;
- Organize groups of pupils and give them activities to do (for example **Activity 9.3**).
- Move around in the classroom and provide probing questions for assistance where necessary;
- Invite some groups to present and guide the whole class to harmonize on how to convert the units of time measurements.

d) Synthesis/summarization

Guide pupils to summarize the relation between time measurements, and how to convert from a unit to another.

For example, 1day = 24 hours, 1 week = 7 days, 1 year= 52 weeks and 1 year = 12 months, 1 year = 365 days.

e) Assessment

- Provide activities to be done by pupils and check their answers. Use for example the **application activity 9.3**
- Assign all pupils a home work to be done.

f) Answer for activities

Find the answers for the above mentioned activities and mark pupils' findings accordingly.

Lesson 9: Converting days into hours

From the previous lesson learners found that a day has 24 hours. Provide activities that help them to convert days into hours and vice versa.

Example: Use activity 9.3 and application activity 9.3

Lesson 10: Converting weeks into days

From the previous lessons learners found that A **week has 7 days**. Provide activities that help them to convert weeks into days and vice versa.

Example: Use activity 9.4 and application activity 9.4

Lesson 11: Converting years into months

From the previous lessons learners found that a **year has 12 months**. Provide activities that help them to convert years into months and vice versa.

Example: Use activity 9.5 and application activity 9.5

Lesson 12: Ordinary year and leap year

After the previous lesson, pupils will be aware of existence of years with 365 days and years with 366 days.

You have to organize a lesson with the objective of determining whether a given year is an ordinary year (with 365 days) or a leap year (366 days).

Guide them to discover how to verify whether a given year is ordinary or leap, use the **activity 9.6.1**, **activity 9.6.2** and **application activity 9.6**.

Lesson 13: Planning daily, weekly and monthly activities

a) Objectives: Prepare a daily, weekly and monthly activities plan

b) Teaching resources and learning resources

- Manila paper on which there is daily activity plans (see the one for Muhoza), weekly activity plan (see the one for Mugisha) and monthly activity plan (see the one for Kamariza).
- Hand outs with different activities to be done by pupils.

c) Teaching and learning activities:

- Ask pupils to tell their friends activities they do from morning to the evening and guide them to harmonize them;
- Invite one pupil in front of others and guide him/her to present activities he can do in the week and guide him/her to organize these activities according to activities for Monday, Tuesday until Sunday's activities;
- Organize groups of pupils and give them activities to do where they have to refer to planned activities (for example activity 9.7.1, activity 9.7.2 and activity 9.7.3) and do a plan for an ordinary P3 pupil;

- Move around in the classroom and provide probing questions for assistance where necessary;
- Invite some groups to present and guide the whole class to harmonize on how to plan activities for a day, for a week and for a month.

d) Synthesis/summarization

- Guide pupils to summarize how to plan activities for a day, for a week and for a month.

e) Assessment

- Provide individual activities to be done by every pupil (use the application activity 9.7) and check their answers;
- Assign all pupils a home work to do.

9.6. Ending points of the unit

a) Summary of the unit

Try to summarize the content for this unit.

b) Additional information for the teacher

- The teacher plays an important role in the learning activity, guide all learning situations and engage every pupil;
- Introduce the concept of time measurement by using concrete watches of different types: watch with numbers and watch with hands and numerals;
- Teach pupils different ways of measuring the capacity; use of non standard units and the use of standard units;
- Be informed about different types of calendars and be able to explain activities to be done on every day depending on one's religion.

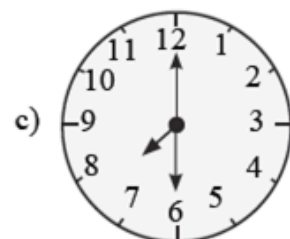
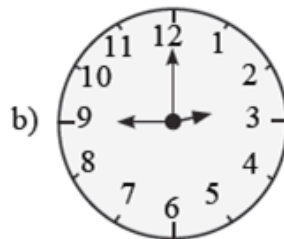
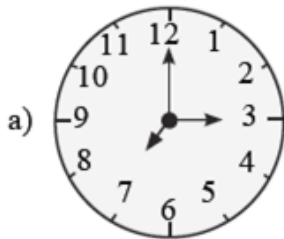
c) Answers for the end unit assessment 9

- a) It is a quarter to two. b) It is ten o'clock
 c) It is a half past seven. d) It is ten o'clock.
- a) 40 years = 480 months.
 b) 50 weeks = 350 days.
 c) 33 days = 792 hours.
 d) 19 years = 228 months.
 e) 29 days = 696 hours.

- 3) a) 365/ 366 c) 7/ 24 b) 4 / 52 d) February.
 4) Ordinary years are: 2002, 2007, 2005.
 5) Leap years are: 2000, 2016, 2008, 2012.
 6) Leap years between 2010 1nd 2010 are: 2012 ; 2016 ; 2020 ; 2024 ; 2028.

d) Remedial activities

1) Read and tell the time:



Answer: a) It is a quarter past seven b) It is a quarter to three. c) It is a half past seven.

2) Draw a clock face showing: A half past nine.

Answer:



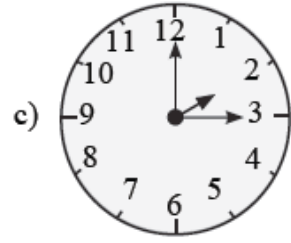
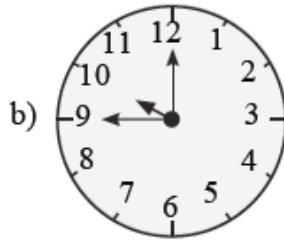
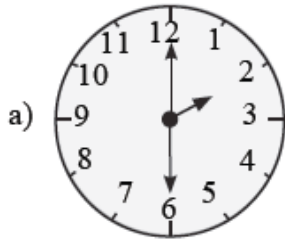
3) Read the calendar of the year 2018 and say the number of days for the following months:

- a) April: 30days, October: 31 days, December: 31 days.
 b) Give 3 months which have 31 days.

Answer: January, March, May, etc.

e) Extension activities

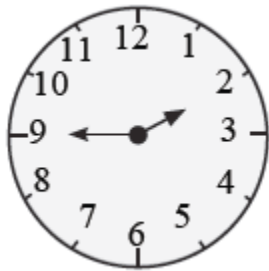
1) Read and tell the time:



Answer: a) It is a half past two. B) It is a quarter to ten. c) It is a quarter past two.

2) Draw a clock face showing: A quarter to two.

Answer:



3) Observe the calendar for the year 2018 and make a calendar for January 2019.

Answer:

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		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	29	30	31		

UNIT 10

TYPES OF LINES AND ANGLES

10.1. Key unit competence

Draw and identify parallel, perpendicular and intersecting lines.

Draw and compare right, acute and obtuse angles

10.2. Prerequisite

Pupils will learn effectively if they refer to types of lines learnt in P2.

10.3. Crosscutting issues to be addressed in the lessons

- **Inclusive education:** Catering for learners with special education needs. Giving to fast-learners extra activities contained in this book. Giving slow learners suitable activities for their level. Giving special treatment to learners with physical impairment, making those with hearing and visual impairment sit in front where possible the teacher uses the special teaching/learning aids.
- **Gender:** Addressed when both boys and girls work together in groups and other activities peacefully without discrimination.
- **Environment and Sustainability:** *When the learner uses different materials and equipment well without damaging or wasting them.*
- **Peace and values education:** *When a learner works with others peacefully without inconveniencing others or disrupting them.*
- Encourage learners to live and work in harmony and share ideas in a peaceful way with respect

10.4. Sub-headings / List of lessons nit

UNIT 10: TYPES OF LINES AND ANGLES (16 Periods)			Reinforcement and Extension	
	Lesson title	Learning objectives	Number of periods	
1	Introductory activity	Arouse the curiosity of learners on the importance of lines and angles.	1	
1	Straight lines	Observe, differentiate and draw straight lines.	1	
2	Parallel lines	Observe, differentiate and draw straight parallel lines.	1	1

3	Straight perpendicular lines	Observe, differentiate and draw straight perpendicular lines.	1	1
4	Straight intersecting lines	Observe, differentiate and draw straight intersecting lines.	1	
5	Remediation	Provide learning support to learners who are falling behind their peers	1	
6	Right angle	Identify and draw right angle.	1	
7	Obtuse angle and Acute angle	Identify and draw an obtuse and an acute angle.	1	
8	Measuring angles.	Measure angles using a protractor.	1	1
9	Drawing angles.	Draw angles using a ruler and protractor.	1	1
10	Comparing angles	Compare the values of angles.	1	
11	End unit assessment	Draw and identify parallel, perpendicular and intersecting lines. Draw and compare right, acute and obtuse angles.	1	
	Total		12	4

10.5. Guidance on different lessons

Lesson 1: Guidance on introductory activity 10

- Invite pupils to read the story of SEBISUSA who does not know to plant crops on straight lines as they are in disorder;
- Guide pupils to discuss the reason one can fail to plant crops on straight lines;
- Ask them to suggest what is required for every one of them to be able to draw geometric figures;
- Move around in the classroom to get aware of different suggestions and ask some probing questions where necessary.
- Invite all pupils to a whole class discussion and basing on their experience, prior knowledge and abilities shown in answering questions for this activity, open a discussion with probing questions to guide them to give their predictions and ensure that you arouse their curiosity on what is going to be learnt in this unit so that they may be able to analyse geometric figures.

Lesson 2: Straight Lines

a) Objective: Observe, give characteristics and draw straight lines

b) Teaching and Learning resources

Manila Paper, Rulers, metre ruler, T-square, different colored pencils.

c) Teaching and Learning Activities

- Invite pupils, show them lines and ask them to give their characteristics (activity **10.1.1**);

What are their characteristics?

a)



b)



c)



- Form groups of pupils and then ask them to describe and draw straight lines,
- Move around in the class for facilitating pupils where necessary and ask probing questions to guide them to draw straight lines;
- Invite some groups to present their findings and then help them to harmonize by explaining the how they draw straight lines: vertical, horizontal and oblique straight lines;
- Give every pupil time to draw at least one of each of the types of lines learnt.

Synthesis/summarization

Guide pupils to explain briefly the different types of straight lines and how to draw them.

Assessment

Give pupils application activities on types of lines found in the pupils' book.

Lesson 3: Parallel Lines

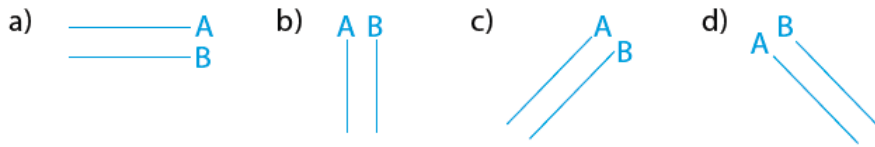
a) Objective: Observe, give characteristics and draw parallel lines

b) Teaching and Learning resources

Manila Paper, sheets of gridded paper, Rulers, metre ruler, T-square, different colored pencils.

c) Teaching and Learning Activities

- Invite pupils, show them objects with parallel lines and ask them to give their characteristics (activity **10.1.2**);



- Form groups of pupils and then ask them to describe and draw parallel lines,
- Move around in the class for facilitating pupils where necessary and ask probing questions to guide them to draw parallel lines;
- Invite some groups to present their findings and then help them to harmonize by explaining the how they draw parallel lines;
- Give every pupil time to draw parallel lines and explore objects with parallel lines: doors, windows, lines of sheets of paper, etc.

Synthesis/summarization

Guide pupils to explain briefly how parallel lines look like.

Assessment

Give pupils application activities on parallel lines. Use the application activity 10.1.2 found in the pupils' book.

Lesson 4: perpendicular lines

a) Objective

Observe, give characteristics and draw intersecting lines **that form right angles**.

b) Teaching and Learning resources

Manila Paper, sheets of gridded paper, Rulers, metre ruler, set-square, different colored pencils.

c) Teaching and Learning Activities

- Invite pupils, show them objects with right angles and ask them to give their characteristics (**activity 10.1.3**);



- Form groups of pupils and then ask them to describe and draw right angles observed on two intersecting lines,



- Move around in the class for facilitating pupils where necessary and ask probing questions to guide them to draw right angles formed by 2 perpendicular lines;
- Invite some groups to present their findings and then help them to harmonize by explaining the how they draw perpendicular lines;
- Give every pupil time to draw perpendicular lines and explore objects with perpendicular lines: doors, windows, lines of gridded sheets of paper, etc.

Synthesis/summarization

Guide pupils to explain briefly how perpendicular lines look like.

Assessment

Give pupils application activities on parallel lines. Use the **application activity 10.1.3** found in the pupils' book.

Lesson 5: Intersecting lines with acute and obtuse angles

a) Objective

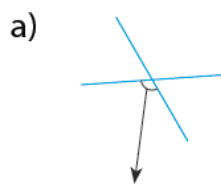
Observe, give characteristics and draw intersecting lines **that form acute and obtuse angles.**

b) Teaching and Learning resources

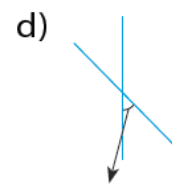
Manila Paper, sheets of gridded paper, scissors, Rulers, metre ruler, set-square, different colored pencils, picture for a roof of a house.

c) Teaching and Learning Activities

- Invite pupils, show them objects such as scissors with intersecting lines and acute angles and ask them to give their characteristics (**activity 10.1.4**);



Obtuse angle



Acute angle

- Form groups of pupils and then ask them to describe and draw intersecting lines with acute and obtuse angles,
- Move around in the class for facilitating pupils where necessary and ask probing questions to guide them to draw intersecting lines with acute and obtuse angles;
- Invite some groups to present their findings and then help them to harmonize by explaining the how they draw intersecting lines with acute and obtuse angles;
- Give every pupil time to draw intersecting lines with acute and obtuse angles and explore objects with acute and obtuse angles: **scissors, roof of a house**, etc.

Synthesis/summarization

Guide pupils to explain briefly how intersecting lines with acute and obtuse angles look like.

Assessment

Give pupils application activities on intersecting lines with acute and obtuse angles. Use the **application activity 10.1.4** found in the pupils' book.

Answers for application activity 10.1.4

- a) A and B are parallel lines
- b) A and C are crossed lines that form both acute and an obtuse angles
- c) A and D are lines that form a right angle
- d) A and F are lines that form and acute and obtuse angles
- e) A and E are lines that forma right angle
- f) B and D are lines that form a right angle.
- g) B and C are intersecting lines that form both acute and obtuse angles.
- h) B and E are intersecting lines that form right angles.

Lesson 6: Right angle

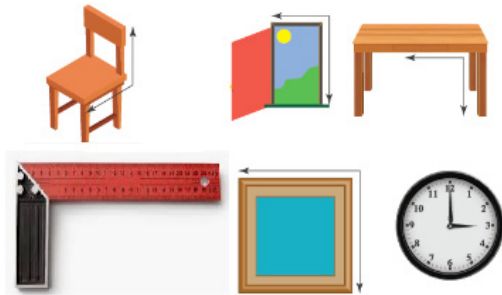
a) **Objective:** Draw a right angle

b) **Teaching and Learning resources**

Manila Paper, Rulers, Metre ruler, T-square, different colored pencils, protractor.

c) **Teaching and Learning Activities**

- Invite pupils to observe objects with different types of angles. Ask them to give types of angles they see.



- Invite them to work in groups and discuss activity 10.2.1, to draw a right angle using a ruler and a protractor;
- Move around in the class for facilitating pupils where necessary and ask probing questions to guide them;
- Invite some groups to present their findings and then help them to harmonize by explaining the characteristics of a right angle and how to draw it;
- Ask the pupils to observe carefully and give the names of the lines that form a right angle.
- Give every pupil time to draw a right angle.

Summary of topic taught

Guide pupils to explain and draw briefly the right angle.

Assessment

Give pupils application activities to be done from in the pupils' book . Use the application activity 10.2.1.

d) **Answers to activities**

Lesson 7: Acute and obtuse angles

a) **Objective:** Observe and Draw obtuse and acute angles

b) **Teaching and Learning resources**

Manila Paper, Rulers, Metre ruler, T-square, different colored pencils, protractor.

c) **Teaching and Learning Activities**

- Invite pupils to observe objects with different types of angles. Ask them to give types of angles they see.



- Invite them to work in groups and discuss activity 10.2.2 and activity 10.2.3 to draw acute angle and obtuse angle using a ruler and a protractor;
- Move around in the class for facilitating pupils where necessary and ask probing questions to guide them;
- Invite some groups to present their findings and then help them to harmonize by explaining the characteristics of obtuse angle and the acute angle and how to draw them;
- Ask the pupils to observe carefully and give the names of the lines that form obtuse angle and the acute angles.
- Give every pupil time to draw obtuse angle and the acute angle.

Summary of topic taught

Guide pupils to explain and draw briefly the obtuse angle and the acute angle.

Assessment

Give pupils application activities to be done from in the pupils' book. Use the application activity 10.2.2.

d) Answers to activities

Answers for application activity 10.2.2

3) a) Right angle b) Acute angle c) Obtuse angle

Lesson 8: Using a protractor to measure and draw angles

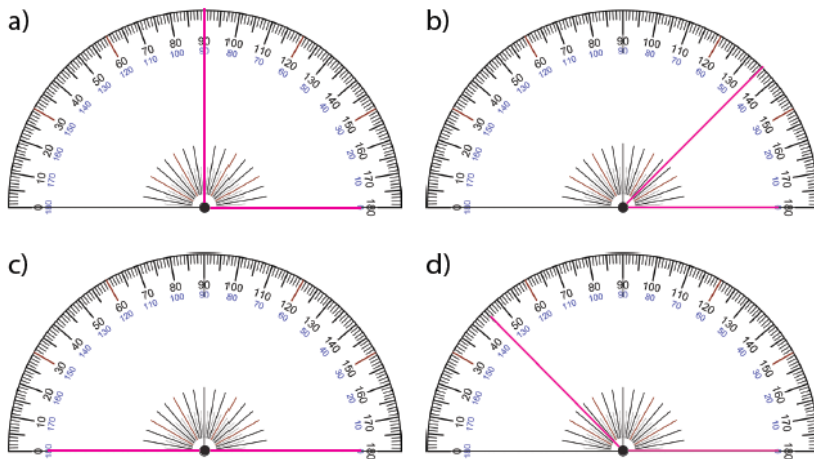
a) **Objective:** Measure angles using a protractor.

b) Teaching and Learning resources

Manila Paper, Rulers, Metre ruler, T-square, different colored pencils, protractor.

c) Teaching and Learning Activities

- Invite some pupils and guide them to demonstrate how to use a protractor and a ruler to draw angles with different values.(**activity 10.3**);



- Invite each pupil to use his/her materials and draw angles of different values you assign to them;
- Move around in the classroom to guide slow learners and show them how to draw angles in their notebooks;
- Help all pupils to harmonize step by step how to draw angles:
 - Place the protractor so that its centre 0 is at the point of intersection of the two lines of that angle;
 - Adjust the protractor so that the horizontal line on it (joining 0 degree and 180 degrees) runs along one of the lines of an angle;
 - Measure the angle by counting the number of degrees from one line of the angle to the next line of that angle.

Summary of topic taught

Guide pupils to explain how they draw different angles.

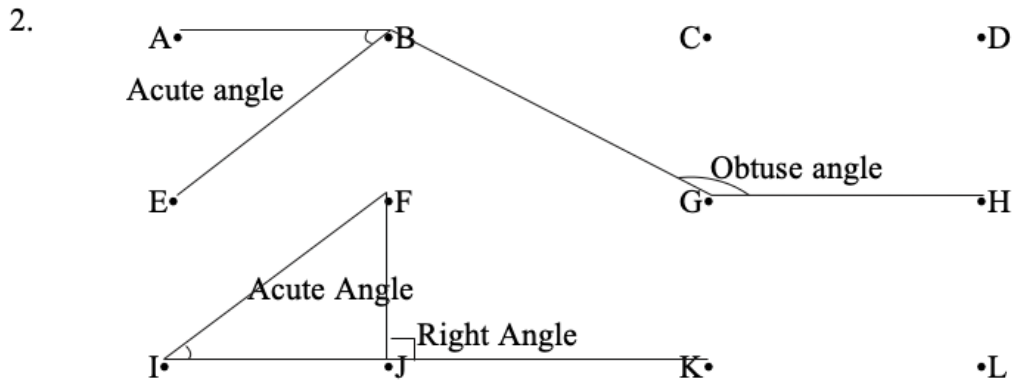
Assessment

Give pupils application activities to be done. Use the application activity 10.3.

c) Answers for activities

Answers to application activity 10.3

1. a) 120 degrees c) 30 degrees e) 50 degrees g) 30 degrees
b) 90 degrees d) 135 degrees f) 90 degrees h) 130 degrees



Lesson 9: Comparing angles

a) **Objective:** Compare the values of angles

b) **Teaching and Learning resources**

Manila Paper, Rulers, Metre ruler, T-square, different colored pencils, protractor.

c) **Teaching and Learning Activities**

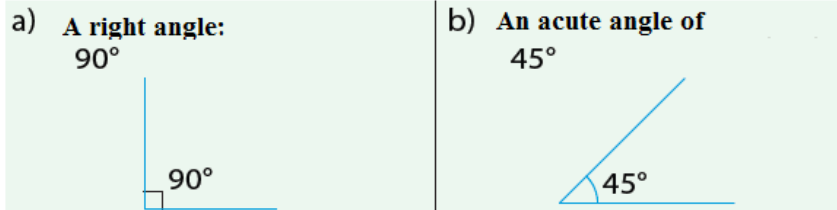
- Invite some pupils and guide them to demonstrate how to use a protractor and a ruler to draw right angle, obtuse angle and acute angle;
- Invite two pupils on the blackboard and guide them to measure the value of a right angle (90 degrees) and the value of acute angle (for example 30 degrees), and then ask other people to compare the two angles before measuring where they will say that the right angle is greater than the acute angle or the acute angle is less than right angle (activity 10.4.1);



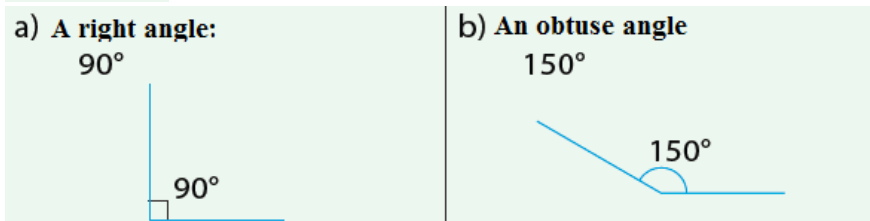
Ask pupils to use the values obtained to compare angles: $90^\circ > 30^\circ$;

- Assign groups of pupils to do the **activity 10.4.2** and **activity 10.4.3**
- Move around in the classroom to guide learners and show them how to draw compare angles by drawing and by using their values in degrees;
- Invite some groups to present their findings and guide all pupils to harmonize the how to compare angles:

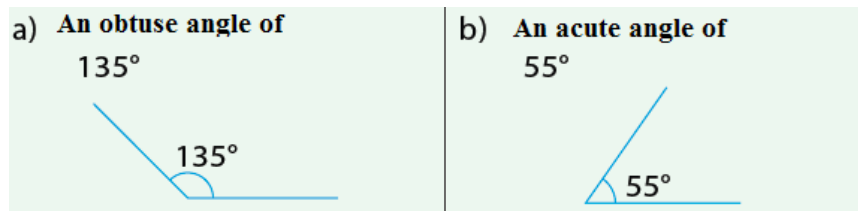
For example: $90^\circ > 45^\circ$



$90^\circ < 150^\circ$



And $135^\circ > 55^\circ$



Assessment

Provide activities to be done and mark them to verify whether your objectives were achieved (use self assessment and pair assessment and **application activity 10.4.3**).

10.6. Ending points of the unit 10

a) Summary of the main topics in the unit

Prepare a summary on types of lines, types of angles and the comparison of angles using their measurements (values) in degrees.

b) Answers for the end unit assessment 10

2) a) Parallel Lines

b) Intersecting lines forming acute and obtuse angles

c) Intersecting lines that form a right angle

d) Intersecting lines that form a right angle

e) Intersecting lines that form obtuse and acute angles

f) Crossed lines that form an obtuse and acute angles

3) a) Right Angle b) Acute angle c) Obtuse angle

6) a) No b) Yes c) Yes d) Yes

c) Remedial activities

1. Draw different types of straight lines and name them
2. Show two objects that have two intersecting lines forming an angle and describe that angle.
3. Using a ruler and gridded paper, draw a right angle and an obtuse angle.

d) Extension activities

1. Use a ruler to draw lines that form a right angle.
2. Use your hands to draw lines that form acute angle and obtuse angle
3. Draw an object that shows different corners with different angles.

UNIT 11

SQUARE, RECTANGLE, TRIANGLE AND CIRCLE

11.1. key unit competence

Drawing and describing a square, rectangle, triangle and circle, finding the perimeter of a square, rectangle, triangle.

11.2. Prerequisites

Pupils will refer to characteristics of a square and rectangle learnt in P2.

11.3. Cross cutting issues to be addressed

- **Environment and Sustainability:** *This occurs when pupils maintain a clean environment where they work, using the Teaching and Learning resources properly or even look for Teaching and Learning resources without damaging anything.*
- **Financial education:** *This appears in exercises requiring pupils to use Teaching and Learning resources carefully that they use for drawing or measuring.*
- **Peace and value:** *This appears when a pupil works with others in a group without disrupting or disturbing others.*

11.4. List of subtopics/ lessons

UNIT 11: SQUARE, RECTANGLE, TRIANGLE AND CIRCLE (16 periods)			Reinforcement and Extension	
	Lesson title	Learning objectives	Number of periods	
1	Introductory activity	Arouse the curiosity of learners on the importance and description of square, rectangle and triangle.	1	
2	Characteristics of a square and Perimeter of a square	Describe characteristics of a square.	1	1
3	Characteristics of a rectangle and Perimeter of a rectangle	Describe characteristics of a rectangle.	1	1

4	General characteristics of a triangle	Describe characteristics of a triangle.	1	
5	Characteristics of an equilateral triangle	Describe properties of an equilateral triangle.	1	
6	Remediation	Provide learning support to learners who are falling behind their peers	1	
7	Characteristics of an isosceles triangle	Describe characteristics of an isosceles triangle.	1	
8	Characteristics of a right angled triangle	Describe characteristics of a right angled or right triangle.	1	
9	Characteristics of a scalene triangle	Describe characteristics of a scalene triangle.	1	
10	Perimeter of a triangle	Calculate the perimeter of a triangle	1	1
11	Characteristics of a circle	Describe characteristics of a circle	1	1
12	Unit assessment	Draw and describe a square, rectangle, triangle and circle, find the perimeter of a square, rectangle and triangle.	1	
	Total		12	4

11.5. Guidance on different lessons

Lesson 1: Guidance on the introductory activity

- Guides pupils to read a short story about Karisa; a farmer who does not know the shape of his garden and the size (perimeter) of the garden yet he/she wants to fence it.
- Invite pupils to discuss the story and come up with views on what the farmer needs to know in mathematics in order to plant his/her crops in a proper way.
- Explain them that the correct answers and explanations will be provided in this unit.

Lesson 2: Characteristics and perimeter of a square

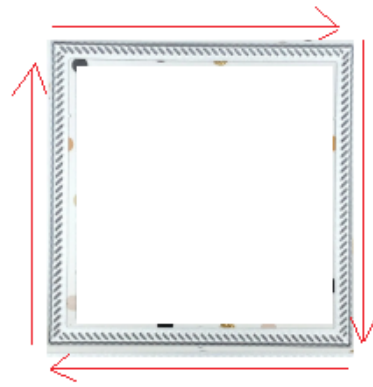
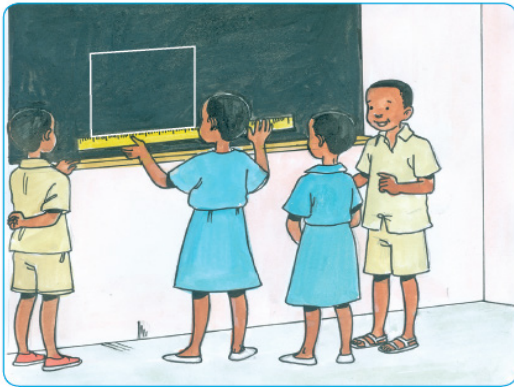
a) **Learning objective:** Explore characteristics of a square.

b) **Teaching and Learning resources**

Manila paper, rulers, mete ruler, T-square, different pencils, paper and boxes.

c) **Teaching and Learning Activities**

- Show pupils a squared surface such as a manila paper and ask the pupils to look at it carefully and tell if sides are of the equal length.



- Use a protractor and a ruler to draw a square and then ask the pupils to look at it carefully and tell its characteristics (activity 11.1.1).
- Ask pupils to go to the blackboard and measure the sides of the square you drew. Ask another pupil to use a protractor to measure the angles of the square you drew and guide others to notify that it is a square;
- Guide every pupil to draw a square, measure the sides of the square and all the angles making sure that all the sides are equal and ensuring that all the angles are right angles.
- Form groups of pupils and assign them to do **activity 11.1.2**, **activity 11.1.3** and **activity 11.1.4**
- Invite some groups to present their findings and guide the whole class to harmonize the characteristics of a square and how to find the perimeter of a squared surface.

Summary of topic taught

- Guide pupils to summarize the characteristics of a square about sides, angles, diagonals and medians.
- Guide pupils to briefly summarize how they find the perimeter of a square:
Perimeter = Side + side + side + side;

The perimeter of a square equals four times of its side.

Or $\text{Perimeter} = \text{Side} \times 4$

Assessment

Give pupils activities about the characteristics and the perimeter of a square. Use the **application activity 11.1.1**.

d) Answers to activities

Answers for activity 11.1.4

- | | |
|---|--|
| 1) a) $640\text{cm} \div 4 = 160\text{cm}$ | c) $312\text{cm} \div 4 = 78\text{cm}$ |
| b) $196\text{cm} \div 4 = 49\text{cm}$ | d) $676\text{cm} \div 4 = 169\text{ cm}$ |
| 2) $\text{Perimeter} = 80\text{m} \times 4 = 320\text{m}$ | |
| 3) $\text{Side } 1700\text{m} \div 4 = 425\text{m}$ | |

Answer for application activity 11.1.1

- 1) The answers differ depending on how the pupil explains objects he/she knows have the shape of a square.
- 2) a) RV is a diagonal b) ZU is a median c) SW is a median d) TY is a diagonal.
- 3) Perimeter in cm is $145 \times 4 = \text{cm } 580$
- 4) Length of one side in m is $160 \div 4 = 40\text{ m}$
- 5) a) Perimeter in cm is $25 \times 4 = 100\text{ cm}$
 b) Perimeter in cm is $35 \times 4 = 140\text{ cm}$.

Lesson 3: Characteristics and perimeter of a rectangle

a) Learning objective: Explore characteristics and the perimeter of a rectangle

b) Teaching and Learning resources

Manila paper, rulers, metre ruler, set-square, different pencils, paper and boxes.

c) Teaching and Learning Activities

- Use a manila paper with a form of a rectangle, show it to pupils then ask them to look at it carefully and tell if all sides have the same length.



- Use a protractor and a ruler to draw a rectangle and then ask the pupils to look at it carefully and tell its characteristics (**activity 11.2.1**).
- Ask pupils to go to the blackboard and measure the sides of the rectangle you drew insisting on parallel sides. Ask another pupil to use a protractor to measure the angles and compare parallel sides of the rectangle you drew and guide others to notify that it is a rectangle;
- Guide every pupil to draw a rectangle, measure the sides of the rectangle and all the angles making sure that parallel sides are equal and ensuring that all the angles are right angles.
- Form groups of pupils and assign them to do **activity 11.2.2**, **activity 11.2.3** and **activity 12.2.4**;
- Invite some groups to present their findings and guide the whole class to harmonize the characteristics of a rectangle and how to find its perimeter.

Summary of topic taught

- Guide pupils to summarize the characteristics of a rectangle about sides, angles, diagonals and medians.
- Guide pupils to briefly summarize how they find the perimeter of a rectangle:
Perimeter = Side + side + side + side; Perimeter = **(Length + Width) x 2**.
Or **Perimeter = (L+W) x 2**

Assessment

Give pupils activities to do about the characteristics and the perimeter of a rectangle: use **application activity 11.2.1** and mark their works.

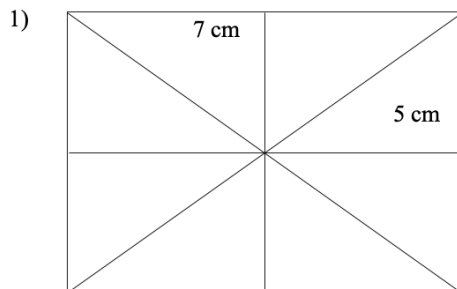
d) Answers for activities

Answers for activity 11.2.2

Question 1

- a) width c) length e) diagonal g) width
b) diagonal d) median f) median h) half width

Question 2



Question 3

Figure a) is a rectangle because two opposite sides are equal in length

Answers for application activity 11.2.1

- 1) Answers are different depending on what objects or things the pupil finds to have the shape of a rectangle in the classroom.
- 2) Answers are different and depend on how the pupil will make a rectangle and hang it in the classroom.
- 3) Answers are different depending on what the pupils know about figures or objects that have a rectangular shape.
- 3) Length=124 cm
Width = 98 cm.
Sum of L and W = 124 cm +98cm = 222cm
Perimeter = 222cm x 2= 444cm
- 4) The perimeter of a rectangular plot = (63 m +39m) x 2= 204m.
- 5) The perimeter for a rectangular table = (250cm +150cm) x2 =800m.

Lesson 4: Characteristics of a triangle

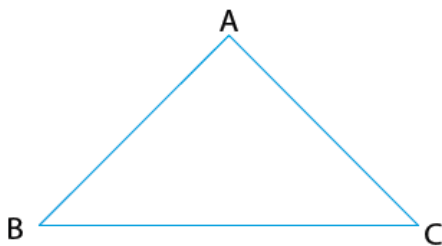
a) Objectives: Explore characteristics of a triangle

b) Teaching and Learning resources

Manila paper, rulers, metre ruler, set-square, different pencils, paper and boxes.

c) Teaching and Learning Activities

- Show pupils an object that has the form of a triangle. Ask them to explore and say the characteristics: number of sides and angles.



Use a protractor and a ruler to draw a triangle and then ask the pupils to look at it carefully and tell its characteristics (**activity 11.3.1**).

- Ask pupils to go to the blackboard and count the number of sides and measure their lengths. Ask another pupil to use a protractor to measure the angles and add them to find their sum and guide others to notify that it is a triangle;

- Guide every pupil to draw a triangle, measure the sides of the triangle and all the angles making sure that the figure has 3 sides and 3 angles.
- Form groups of pupils and assign them to do the second question of activity 11.3.1;
- Invite some groups to present their findings and guide the whole class to harmonize the characteristics of a triangle.

Summary of topic taught

Guide pupils to summarize the characteristics of a triangle: it has 3 sides and 3 angles.

Assessment

Give pupils activities to do about the characteristics of a triangle and mark their works. Use the **application activity 13.3.1**.

Lesson 5: Characteristics of equilateral triangle

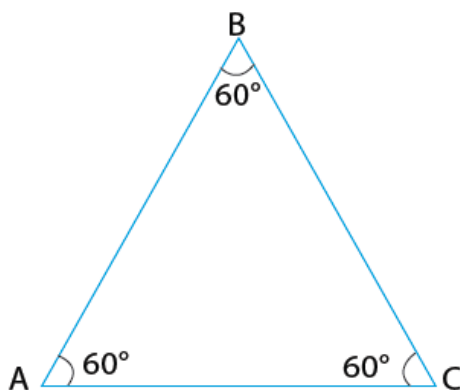
a) Objectives: Describe characteristics of an equilateral triangle.

b) Teaching and Learning resources

- Manila paper, rulers, metre, T-square, different pencils, paper and boxes
- Audio and physical teaching and learning resources for pupils with visual impairment
- Sign language for those with speech impairment.

c) Teaching and Learning Activities

- Ask pupils to say whether or not all triangles have the same characteristics considering the length of their sides;



- With different probing questions guide pupils to realize that, a triangle may have 3 equal sides, 2 equal sides or that 3 sides may have different lengths;
- Form groups of pupils and assign them to do **Activity 11.3.2**.
- Invite some groups to present their findings and guide the whole class to harmonize them;

Summary of topic taught

Guide pupils to summarize the characteristics of an equilateral triangle: It has 3 equal sides and 3 angles of the same value of 60 degrees. .

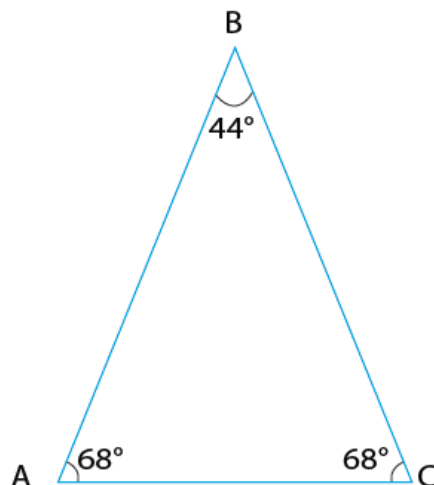
Assessment

Give pupils activities to be done in pairs, monitor and then support slow learners: Use **application activity 11.3.2**.

You can put pieces of paper having different types of triangle in a box then ask each pupil to pick a piece of paper from the box, unfold the paper and say loudly the type of triangle on it.

Lesson 6: Characteristics of isosceles triangle.

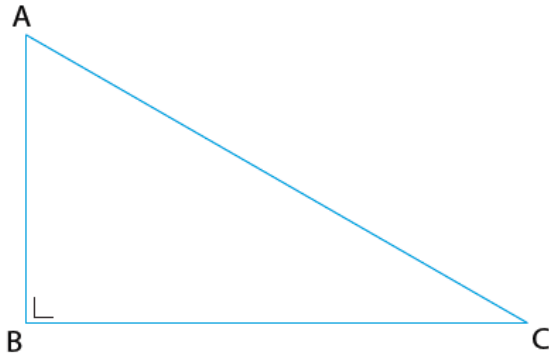
Objective: Explore characteristics of an isosceles triangle.



Note: This lesson is taught like the previous lesson. Use **activity 13.3.3** and **application activity 13.3.3**

Lesson 7: Characteristics of a right-angled triangle

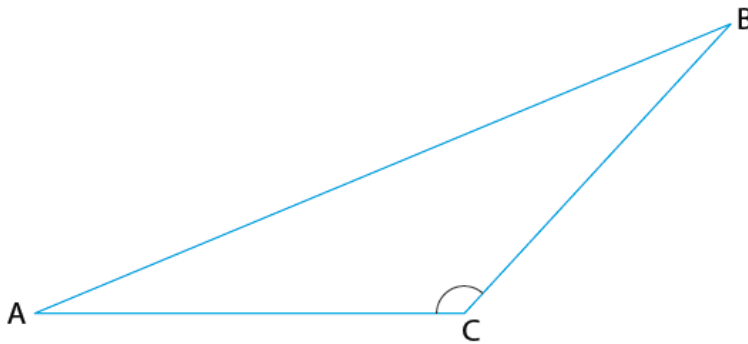
Objective: Explore characteristics of a right angled triangle.



Note: This lesson is taught like the previous lesson. Use **activity 13.3.4** and **application activity 13.3.4**. Highlight that A right angled triangle has a right angle that measures 90 degrees.

Lesson 8: Characteristics of a scalene triangle

Objective: Explore characteristics of a scalene triangle.



Note: This lesson is taught like the previous lesson. Use **activity 13.3.4** and **application activity 13.3.5**. Highlight that all sides of a scalene triangle are not equal, they are different in length. All angles are not equal.

Lesson 9: Perimeter of a triangle

a) Objectives: Calculate the perimeter of a triangle

b) Teaching and Learning resources

Manila paper, rulers, metre ruler, T-square, different pencils, paper and boxes

c) Teaching and Learning activities

- - Draw a triangle and ask pupils to measure the total length of all its sides,

- Ask them to discover other way of finding how they should get that total length called also a perimeter of that triangle: Guide pupils to consider different types of triangles;
- Form groups of pupils and guide them to do activity 11.3.6 and activity 11.3.7;
- Invite some groups to present and guide the whole class to harmonize their findings.

Summarization

Guide pupils to briefly summarize how they find the perimeter of a triangle:

The perimeter of a triangle = First side + second side + third side

The perimeter of an equilateral triangle equals three times of the side, this means

Perimeter = side \times 3

Assessment:

Give pupils activities on how to find the perimeter of a square found in the pupils book: **application activity 11.3.7.**

d) Answers for activities in this lesson

Answers activity 11.3.7

- a) Perimeter: 230 cm + 250 cm + 350 cm = 830 cm
- b) Perimeter: 150 cm + 150 cm + 150 cm = 450 cm
- c) Perimeter: 270 dm + 270 dm + 110 dm = 650 dm
- d) Perimeter: 75 cm + 59 cm + 68 cm = 202 cm

Answers for application activity 11.3.3.7

- a) Perimeter: 30 cm + 30 cm + 30 cm = 90 cm
- b) Perimeter: 43 cm + 43 cm + 70 cm = 156 cm
- c) Perimeter: 30 cm + 50 cm + 58 cm = 138 cm

Lesson 8: Characteristics of a circle

a) Objectives: Explore characteristics of a circle

b) Teaching and Learning resources

Manila paper, rulers, metre ruler, s-square, different pencils, paper and boxes, a rope.

c) Teaching and Learning activities

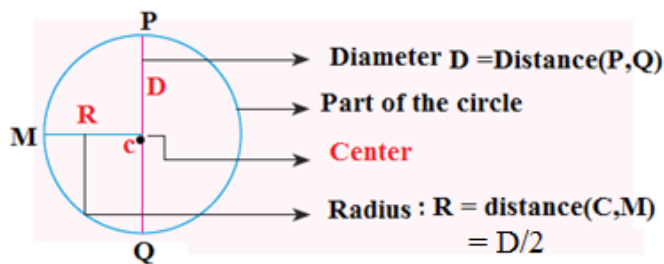
- Use a pair of compasses, a protractor and a ruler to draw a circle and then ask pupils to look at the circle and state its characteristics; guide them to understand concept of **diameter** and **radius** of a circle.



- Ask pupils to go to the blackboard and use a ruler to measure diameter and radius of the circle drawn on the blackboard (**activity 11.4.1**);
- Invite them to describe a circle basing on the diameter and radii they measured (**activity 11.4.2** and **activity 11.4.3**);
- Invite some groups to present findings and guide them to harmonize.

Summary

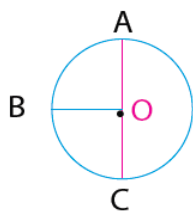
Guide pupils to summarize the characteristics of a circle and highlight the following concepts:



Assessment

- Guide each pupil to draw a circle and measure both the diameter and the radius of the circle.
- Give pupils the **application activity 11.4** and mark them to verify whether the objectives were achieved.

Answers for application activity 11.4



- a) **OC** is a radius c) **AC** is a diameter
b) **OB** is a radius d) **OA** is a radius

11.6. Ending points of the Unit

a) Summary of the content of this unit

As a teacher, you should have a summary on the characteristics of a square, rectangle, triangle, circle, how to find the perimeter of a square, rectangle, and triangle.

b) Answers for the end unit assessment 11

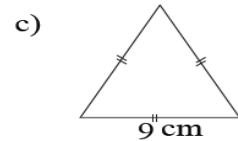
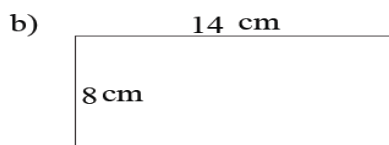
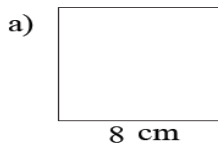
- 1) a) Circle c) Rectangle
 b) Right triangle d) Obtuse triangle
 f) Square e) Isosceles triangle g) Equilateral triangle
- 2) Answers differ since each pupil draws the figures he/she was asked to by the teacher
- 3) a) Perimeter $135 \text{ cm} \times 4 = 540 \text{ cm}$
 b) Perimeter $(364 \text{ cm} + 132 \text{ cm}) \times 2 = 992 \text{ cm}$
 c) Perimeter $605 \text{ cm} + 235 \text{ cm} + 385 \text{ cm} = 1225 \text{ cm}$
- 4) a) No b) Yes c) No d) Yes e) No
- 5) a) Perimeter: $30 \text{ cm} + 50 \text{ cm} + 40 \text{ cm} = 120 \text{ cm}$
 b) Perimeter: $(50 \text{ cm} + 30 \text{ cm}) \times 2 = 160 \text{ cm}$
 c) Perimeter: $15 \text{ cm} \times 4 = 60 \text{ cm}$
 d) Perimeter: $50 \text{ cm} + 110 \text{ cm} + 50 \text{ cm} = 210 \text{ cm}$
- 6) a) 1) Length 4) Median 7) Rectangle
 2) Diagonal 5) Right angled Triangle 8) Right angled triangle
 3) Width 6) Median
 b) 1) Diameter 4) Radius 7) Radius
 2) Radius 5) Radius 8) Radius
 3) cord 6) Radius 9) Diameter 10) Radius

c) Remedial activities

1) Fill the blank with a correct word

- a) A square has.....equal sides andright angles
- b) The longer side of a rectangle is called.....
- c) The shorter side of a rectangle is called.....
- d) Equilateral triangle hassides equal andangle equal.
- e) A point which is located in the middle of a circle is called.....
- f) A straight line that passes through the centre of a circle and touches the perimeter of the circle is called

2) Find the perimeter of the figures below



3) Find the perimeter of a square whose side is 25 cm.

4) Find the perimeter of a rectangle whose length is 19 cm and the width is 11 cm.

d) Extension activities

1) Draw:

- a) A square of 9 cm a side
 - b) A rectangle of 12 cm length and 8 cm width
 - c) An equilateral triangle of side 10 cm
 - d) Isosceles triangle
 - e) Right angled triangle
 - f) Any triangle
 - g) A circle with diameter of 12 cm
- 2) Find the perimeter of a rectangle with a length of 75 cm and a width of 55 cm.
- 3) Find the perimeter of a farm which has the shape of a square whose side equals to 256 m.
- 4) Find the perimeter of a triangle with sides of 18 cm, 25 cm and 37 cm.
- 5) Explain key characteristics of a circle.

UNIT 12 GRIDS

12.1. Key unit competence

Draw grids, locate and put points or geometric figures on the grid according to its posts and crossing bars (coordinates).

12.2. Prerequisite

To do some activities of locating a point on a grid as it was learnt in P2.

12.3. Cross cutting issues to be addressed

- **Gender balance:** addressed when both girls and boys are equally treated during task distribution;
- **Environment and Sustainability:** *This occurs when pupils maintain a clean environment where they work, using the Teaching and Learning resources properly or even look for Teaching and Learning resources without damaging anything.*
- **Peace and value:** *This appears when a pupil works with others in a group without disrupting or disturbing others.*

12.4. List of sub-topics/lessons

UNIT 12: GRIDS (8 periods)			Reinforcement and Extension	
	Lesson title	Learning objectives	Number of periods	
1	Introductory activity	Arouse the curiosity of learners on the importance of grid.	1	
2	Characteristics of a grid: Posts and crossing bars.	Explore characteristics of a grid: Posts and crossing bars.	1	
3	Locating a point on a grid	Locate a point in a grid.	1	1
4	Drawing shapes in a grid: square, rectangle and a triangle.	Draw a shape in a grid.	2	1

	Unit assessment	Draw grids, locate and put points or geometric figures in the grid according to its posts and crossing bars (coordinates).	1	
	Total		6	2

12.5. Guidance on different lessons

Lesson 1: Guidance on the introductory activity 12

- Guides the class to read a short story of a pupil who is selected to represent others in a drawing competition.
- Invite the class to discuss the story and give views on what the pupil need to lean on grid.
- Explains that the correct answers and explanations will be provided in this unit.

Lesson 2: Characteristics of a grid

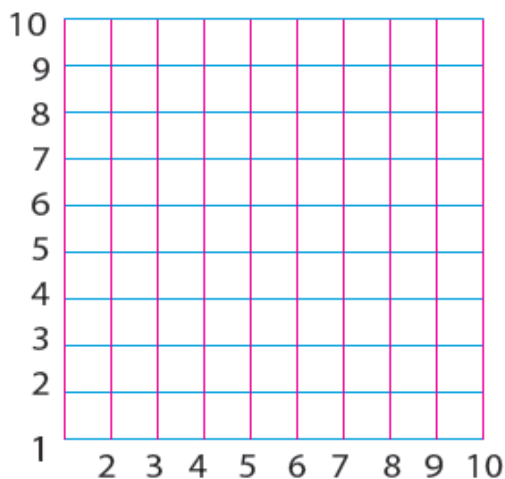
a) Objective: Explore characteristics of a grid: Posts and crossing bars

b) Teaching and Learning resources

Manila paper, rulers, metre, set-square, different pencils, paper and boxes.

c) Teaching and Learning Activities

- Draw a grid and ask the pupils to look at it carefully. Ask them to tell you the number of horizontal lines and vertical lines it is made of, how to number them from the first to the last;



- Form groups and ask pupils to draw a grid of their own and then they explain its characteristics (**activity 12.1.1**);
- Ask each pupils to draw a grid and explain the number of horizontal and vertical lines it is made of.
- Invite pupils in a whole class discussion to discuss how to number posts and crossing bars of a grid.

Summary of topic taught

Guide pupils to summarize the properties of a grid:

- A grid is made with vertical lines (posts) and horizontal lines (crossing lines).
- The numbering of vertical lines is done from the left to the right side,
- The numbering of horizontal lines is done from bottom to top.

Assessment

Give pupils activity on how to make a grid

d) Answers for activities

Answers for Activity 12.1

It is made of 10 vertical lines and 10 horizontal lines.

Lesson 2: Locating a point on a grid

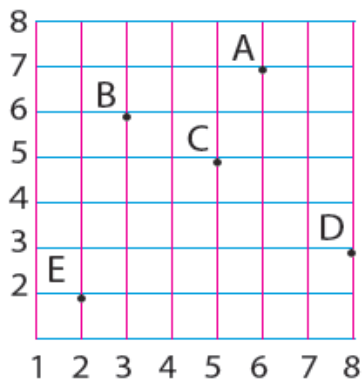
a) **Objective:** Locate a point on a grid

b) **Teaching and Learning resources**

Manila paper, rulers, metre, set-square, different pencils, paper and boxes.

c) **Teaching and Learning Activities**

- Form groups of pupils and assign them the activity 12.2.1 where they identify the position of a point by indicating post and the crossing bar that form the point;



- Invite pupils to a whole class discussion where some groups present their answers by explaining why such a location of the point;

Summary

Guide pupils to summarize the way a point is located on a grid:

When locating a point on a grid, we start by the number of the post and then the number of the crossing bar which form that point. **Example:** The point A is located at the intersection of post number 3 and the crossing bar number 3 and we write A (3,3).

- Guide each pupil to draw a grid and then ask them to locate different points on the grid they have drawn.

Assessment

Give pupils the activity 12.2.2 and mark their works.

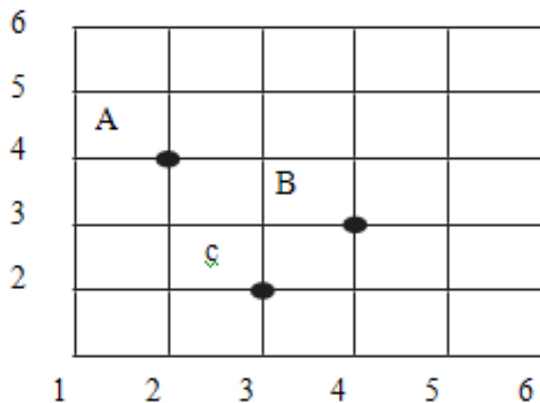
d) Answers to activities

Answer for Activity 12.2

1) A(6,7) B (3,6) C(5,5) D(8,3) E (2,2)

Note: Guide pupils to be able to explain the meaning of D (8,3): the point D is located at the intersection of post number 8 and the crossing bar number 3.

2)



Answer for Application activity 12.2

A (3,7) B (6,6) C. (3,5) D (4,3) E (6,2).

Lesson 3: Drawing shapes on a grid and location of vertices

a) **Objectives:** Draw shapes on a grid

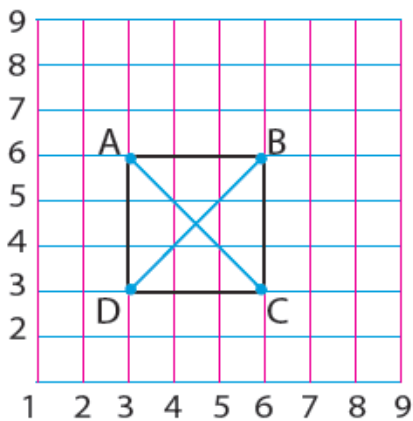
b) **Teaching and Learning resources**

Manila paper, rulers, metre, s-square, different pencils, gridded paper and boxes.



c) **Teaching and Learning Activities**

- Draw three grids and draw a square in the first grid, a rectangle in the second and a triangle in the third.



- Ask pupils to look carefully at the grids and explain how each figure was drawn in the grid (**Activity 12.3.1, Activity 12.3.2 and Activity 12.3.3**);
- Ask pupils in pairs to draw a grid and then draw any figure of their choice in the grid whether a square, rectangle or triangle and explain how they made it;

Summary of topic taught

Guide pupils to summarize how to draw shapes on a grid:

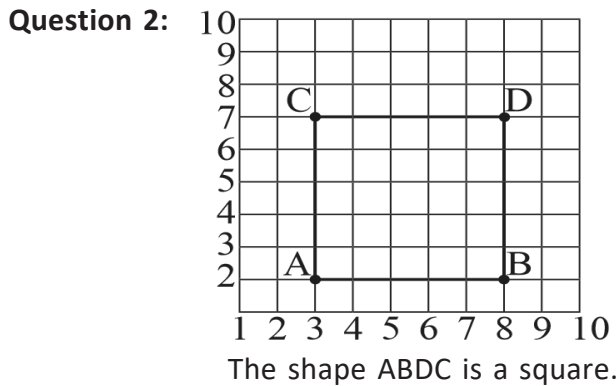
- First locate the vertices of the figure (points),
- Match those points using a ruler in order to get the figure.

Assessment

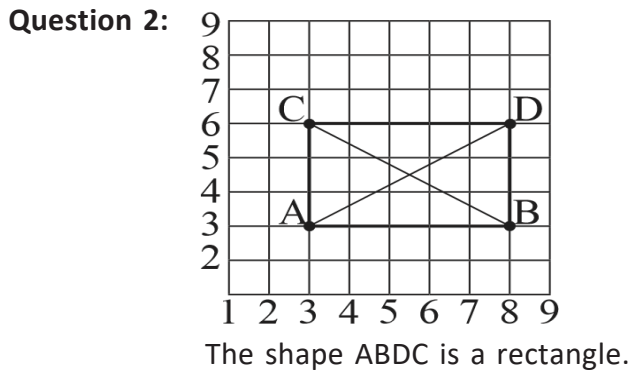
- Give pupils activities to be done: **Application activity 12.3.**
- Guide each pupil to draw a grid and then ask them to draw any figure on the grid they have drawn.

d) Answers to activities

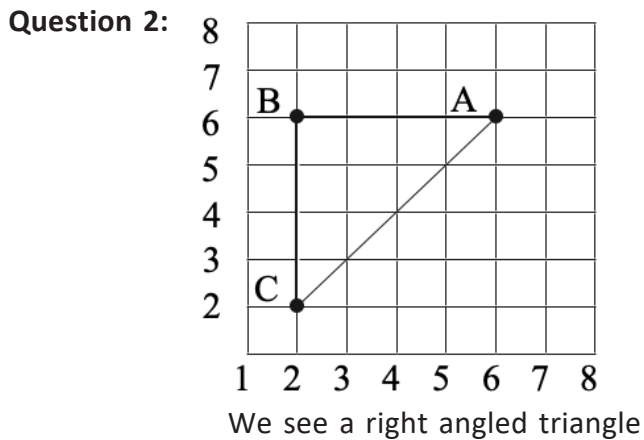
Answer for activity 12.3.1



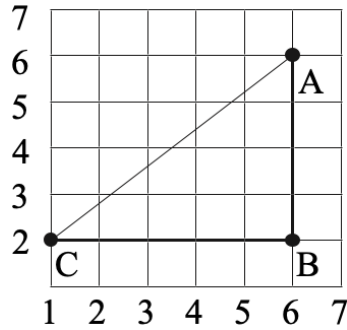
Answer for activity 12.3.2



Answer for activity 12.3.3



Question 3:



We see a right angled triangle CBA

Answer for application activity 12.3.3

The answers differ depending on what each pupil chooses to draw and the vertices of the figure they have drawn. As a teacher verify answers for all pupils.

12.6. Ending points of the unit 12

a) Summary of the content of the unit

As a teacher, you should have the summary on characteristics of a grid, locating a point on a grid, and how to draw different figures on a grid by indicating their vertices.

b) Answers to the end unit assessment 12

1. A (2,8) B (5,8) C (3,4) D (8,3) E (5,2)
2. a) Square b) Rectangle c) Triangle

Remedial activity

Draw any square and a rectangle of your choice in a grid.

Extension activities

Draw a square, rectangle and a triangle in a grid and explain how you can do it as quick as possible.

UNIT 13 MISSING NUMBER IN ADDITION, SUBTRACTION, MULTIPLICATION AND DIVISION

13.1. Key unit competence

To find the missing number using rules of counting and to show the rule that was used

13.2. Prerequisites

To find the missing number in addition, subtraction, multiplication and division as it was done in P2.

13.3. Cross cutting issues to be addressed

- **Gender:** Doing exercises and activities in groups of both girls and boys where everyone has equal right to express his//her ideas.
- **Peace and value education:** when a pupil works with others in agreed manner without disrupting or disturbing others.
- **Financial education:** This appears in exercises requiring pupils to use Teaching and Learning resources carefully and when they find the unknown number of money to be achieved in the given conditions (when a given operation was applied).

13.4. List of sub-topics/ lessons

UNIT 13: MISSING NUMBER IN ADDITION, SUBTRACTION, MULTIPLICATION AND DIVISION (16 periods)				Reinforcement and Extension	
	Lesson title	Learning objectives	Number of periods		
1	Introductory activity	Arouse the curiosity of learners on the importance and description of square, rectangle and triangle	1		
2	Finding missing number in the expression with addition or subtraction	Find missing number in an expression involving addition or subtraction	1	1	
4	Finding missing number in the expression with multiplication or division	Find missing number in an expression involving multiplication or division	1	1	

6	Equality involving addition or subtraction	Find the missing number in an equality involving addition or subtraction	1	
8	Equality involving multiplication or division	Find the missing number in an equality involving multiplication or division	1	
	Remediation	Provide learning support to learners who are falling behind their peers	1	
10	Finding the common difference in ascending (increasing) number pattern	Find the common difference in ascending (increasing) number pattern.	1	1
11	Finding the common difference in a descending (decreasing) number pattern	Find the common difference in a descending (decreasing) number pattern.	2	
12	Finding the missing number in a number pattern	Find the missing number in a number pattern.	2	1
	Unit assessment	Find the missing number using rules of counting and to show rule that was used.	1	
	Total		12	4

13.5. Guidance on different lessons

Lesson1: Guidance on the introductory activity

- Invite pupils to read a short story of Mugenzi and Mugeni who won a competition. Each one did not know the value of the award received.
- Ask the class to discuss the story and give views on the following:

$$15 \times 400 = \underline{\quad} \text{ and } 50 \times 100 = \underline{\quad}$$

- Invite pupils to choose the best award. Let them discuss what Mugenzi and Mugeni need to know in Mathematics;
- Arouse the curiosity of pupils on the content they will learn in unit 13. Tell them that the correct answers and explanations will be provided in this unit.

Lesson 2: Finding the missing number in the expression involving addition or subtraction

a) Objectives

Determine the missing number in the expression involving the addition or subtraction.

b) Teaching and Learning resources

Table of place value, abacus, multiplication tables and number cards in different colors.

c) Teaching and Learning Activities

- Guide pupils to find the missing number in a number sentence with addition or subtraction (see **Activity13.1.1** and **Activity13.1.2**);

To find missing digit of term, I subtract a given of another term from a digit of the sum

$$\begin{array}{r}
 1) \quad \begin{array}{r} 2 \bullet 5 \\ + 16 \bullet \\ \hline 398 \end{array} \quad \begin{array}{l} 5 + \bullet = 8 \longrightarrow 8 - 5 = 3 \\ \bullet + 6 = 9 \longrightarrow 9 - 6 = 3 \end{array} \quad \longrightarrow \quad \begin{array}{r} 235 \\ + 163 \\ \hline 398 \end{array}
 \end{array}$$

$$\begin{array}{r}
 2) \quad \begin{array}{r} \bullet 3 \bullet 5 \\ + 1 \bullet 6 \bullet \\ \hline 6579 \end{array} \quad \begin{array}{l} 5 + \bullet = 9 \longrightarrow 9 - 5 = 4 \\ \bullet + 6 = 7 \longrightarrow 7 - 6 = 1 \\ 3 + \bullet = 5 \longrightarrow 5 - 3 = 2 \\ \bullet + 1 = 6 \longrightarrow 6 - 1 = 5 \end{array} \quad \longrightarrow \quad \begin{array}{r} 5325 \\ + 1264 \\ \hline 6589 \end{array}
 \end{array}$$

- Invite learners to discover the rule applied when finding the missing number in the expression with addition or subtraction;
- Form groups and ask pupils to do more activities;
- Invite some group to present answers by explaining how they worked to find the missing numbers and guide pupils to conclude;

Summary

Guide pupils to summarize the steps they follow in finding the missing number:

- To find the missing number in addition, you subtract the given number from the sum and the difference is the missing number in addition.

Example: $4+6 =11$ The sum is 11. Therefore, $6 =11- 4$ or $4 =11- 6$.

- To find the missing number in subtraction:

Example: $25 - 10 = 15$:

The smaller number is 10, the bigger number is 25, the difference is 15.

- You subtract the difference from the bigger number in case the missing number is in the smaller number. $10 = 25 - 15$.
- You add the difference and the bigger number in case the missing number is in the greater number. $25 = 15 + 10$

Assessment

- Give pupils the **application activity** on how to find the missing number in addition and subtraction. Use **application activity 13.1**.
- Make small pieces of paper with exercises on finding the missing number, put them in a box and ask each pupil to pick one paper, do the exercise on the piece of paper and explain how to do it.

d) Answers for activity

Activity 13.1.1

Question 1

$$\begin{array}{r} \text{a) } 6\ 307 \\ + 2\ 442 \\ \hline 8\ 749 \end{array}$$

$$\begin{array}{r} \text{b) } 5\ 895 \\ + 2\ 154 \\ \hline 8\ 049 \end{array}$$

$$\begin{array}{r} \text{c) } 4\ 387 \\ + 5\ 511 \\ \hline 9\ 848 \end{array}$$

Question 2

$$\begin{array}{r} \text{a) } 7\ 684 \\ + 1\ 112 \\ \hline 8\ 796 \end{array}$$

$$\begin{array}{r} \text{b) } 2\ 443 \\ + 1\ 316 \\ \hline 3\ 759 \end{array}$$

$$\begin{array}{r} \text{c) } 4\ 367 \\ + 3\ 431 \\ \hline 6\ 798 \end{array}$$

Activity 13.1.2

Question 1

$$\begin{array}{r} \text{a) } 9\ 562 \\ - 8\ 132 \\ \hline 1\ 430 \end{array}$$

$$\begin{array}{r} \text{b) } 4\ 321 \\ - 2\ 120 \\ \hline 2\ 201 \end{array}$$

$$\begin{array}{r} \text{c) } 7\ 767 \\ - 3\ 445 \\ \hline 4\ 322 \end{array}$$

Question 2

$$\begin{array}{r} \text{a) } 2\ 130 \\ - 1\ 120 \\ \hline 1\ 010 \end{array}$$

$$\begin{array}{r} \text{b) } 6\ 621 \\ - 3\ 420 \\ \hline 2\ 201 \end{array}$$

$$\begin{array}{r} \text{c) } 5\ 456 \\ - 4\ 211 \\ \hline 1\ 245 \end{array}$$

Application activity 13.1

Question 1

$$\begin{array}{r} \text{a)} \quad 6 \bullet 4 \bullet \\ + \bullet 4 \bullet 2 \\ \hline 9 \ 745 \end{array}$$

$$\begin{array}{r} \text{b)} \quad 4 \bullet 67 \\ + \bullet 4 \bullet \bullet \\ \hline 6 \ 798 \end{array}$$

$$\begin{array}{r} \text{c)} \quad \bullet 456 \\ + 4 \ 5 \bullet \bullet \\ \hline 7 \bullet 79 \end{array}$$

Question 2

$$\begin{array}{r} \text{a)} \quad 6 \ 694 \\ - \quad 1 \ 374 \\ \hline 5 \ 320 \end{array}$$

$$\begin{array}{r} \text{b)} \quad 2 \ 799 \\ - \quad 1 \ 259 \\ \hline 1 \ 540 \end{array}$$

$$\begin{array}{r} \text{c)} \quad 3 \ 772 \\ - \quad 1 \ 452 \\ \hline 2 \ 321 \end{array}$$

Lesson 3: Finding the missing number in a number sentence involving multiplication or division

a) Objective: Find the missing number in a number sentence involving multiplication or division

b) Teaching and Learning resources

Table of place value, abacus, multiplication tables and number cards in different colors.

c) Teaching and Learning Activities

- Guide pupils to find the missing number in a number sentence with multiplication or division (see **Activity13.21** and **Activity13.2.2**);

$$7 \times \bullet = 1638 \rightarrow 1638 \div 7 = 234 \rightarrow 7 \times 234 = 1638$$

$$\begin{array}{r} 234 \\ 7 \overline{) 1638} \\ \underline{-14} \\ 023 \\ \underline{-21} \\ 028 \\ \underline{-28} \\ 00 \end{array}$$

- Invite some group to present answers by explaining how they worked to find the missing numbers and guide pupils to conclude;

- Guide learners to discover the rule applied when finding the missing number in the expression with multiplication or division;

Summary

Guide pupils to summarize the steps they follow when finding the missing number:

- To find the missing number in multiplication,
When the number is a factor, divide the product by another factor.

Example, $8 \times 3 = 24$, $8 = 24 \div 3$

When the number is a product, multiply the 2 factors. $8 \times 3 = 24$, $24 = 8 \times 3$

- To find the missing number in division:
 - You multiply the quotient by the divisor in case the missing number is the dividend.
 - You divide the dividend by the quotient in case the missing number is the divisor.

Assessment

- Give pupils the **application activity** on how to find the missing number in multiplication or division. Use **application activity 13.2**.
- Make small pieces of paper with exercises on finding the missing number, put them in a box and ask each pupil to pick one paper , do the exercise on the piece of paper and explain how they do it.

d) Answers for activities

Activity 13.2.1

Question1

- a) $4 \times 250 = 1\ 000$ c) $945 \times 7 = 6\ 615$ c) $8 \times 789 = 6\ 312$
 b) $1\ 610 \times 5 = 8\ 050$ d) $564 \times 9 = 5\ 076$ d) $6 \times 987 = 5\ 922$

Question 2

a) $\begin{array}{r} 154 \\ \times 9 \\ \hline 1\ 386 \end{array}$	b) $\begin{array}{r} 324 \\ \times 8 \\ \hline 2\ 592 \end{array}$	c) $\begin{array}{r} 451 \\ \times 9 \\ \hline 4059 \end{array}$
--	--	--

Activity 13.2.2

Question 1

- a) $1750 \div 5 = 350$ d) $147 \div 21 = 7$ g) $9\ 672 \div 3\ 224 = 3$
b) $360 \div 90 = 4$ e) $15 \div 6 = 90$ h) $9\ 819 \div 1\ 091 = 9$
c) $15 \div 8 = 120$ f) $225 \div 75 = 3$ i) $5\ 274 \div 586 = 9$

Question 2

- a) $270 \div 6 = 45$ b) $445 \div 5 = 89$ c) $500 \div 4 = 125$

Application activity 13.2

Question 1

a)	$\begin{array}{r} 2\ 396 \\ \times 4 \\ \hline 9\ 584 \end{array}$	b)	$\begin{array}{r} 3\ 289 \\ \times 3 \\ \hline 9\ 867 \end{array}$	c)	$\begin{array}{r} 4\ 897 \\ \times 2 \\ \hline 9\ 794 \end{array}$
----	--	----	--	----	--

Question 2

- a) $8\ 795 \div 1759 = 5$ b) $7\ 362 \div 9 = 818$ c) $9\ 534 \div 1\ 598 = 6$

Lesson 3: Concept of equality of two expressions with addition and subtraction

a) Objectives

Find the missing number in an equality involving addition or subtraction

b) Teaching and Learning resources

Table of place values, abacus, number cards, Manila paper.

c) Teaching and Learning Activities

Step 1: Equality of two sums (with addition)

- Guide pupils to do activities on equality whose members are made of the sum of two terms;
- Delete one term and ask pupils to establish how they can calculate that missing term (use **activity 13.3.1**);

a)	$100 + 25 = 90 + \bullet$	$\longrightarrow (100 + 25) - 90 = 35$
		$\longrightarrow 100 + 25 = 90 + 35$
b)	$45 + \bullet = 40 + 60$	$\longrightarrow (40 + 60) - 45 = 55$
		$\longrightarrow 45 + 55 = 40 + 60$
c)	$75 + 30 = \bullet + 25$	$\longrightarrow (75 + 30) - 25 = 80$
		$\longrightarrow 75 + 30 = 80 + 25$
d)	$\bullet + 90 = 270 + 80$	$\longrightarrow (270 + 80) - 90 = 260$
		$\longrightarrow 260 + 90 = 270 + 80$

- form groups and ask pupils to do activities on equality involving addition (activity 13.3.2);
- Invite the whole class discussion and harmonize groups' findings

Summary

Guide pupils to summarize the steps they follow when finding a missing number: add two numbers of the other member and you subtract the remaining number from the sum you got.

$$100 + 25 = 90 + \bullet \longrightarrow (100 + 25) - 90 = 35$$

Assessment

Give pupils more activities for application. Use question 1 of the application activity 13.3 on how to find a missing number in an equality.

Answer for Activity 13.3.1

Question 1

- | | |
|--------------------------|---------------------------|
| a) $80 + 30 = 50 + 60$ | c) $265 + 35 = 250 + 50$ |
| b) $150 + 95 = 200 + 45$ | d) $479 + 51 = 350 + 180$ |

Question 2

- | | |
|----------------------------|----------------------------|
| a) $913 + 97 = 803 + 207$ | c) $909 + 597 = 987 + 519$ |
| b) $495 + 575 = 195 + 875$ | d) $825 + 795 = 962 + 658$ |

Step 2: Equality in subtraction (of two differences)

- Guide pupils to do activities on equality whose members are made of the difference of two terms;
- Delete one term and ask pupils to establish how they can calculate that missing term (use Activity 13.3.2);
- Invite the whole class discussion and harmonize groups' findings.

Summary

- Guide pupils to summarize the steps they follow when finding a missing number:

When the missing number is a minuend, find the difference of the other member and you add their difference to the remaining number of the second member.

$$\bullet - 95 = 180 - 25 \longrightarrow (180 - 25) + 95 = 250$$

- When the missing number is a subtrahend, find the other difference and you subtract their difference from the remaining number of second member.

$$145 - \bullet = 175 - 65 \longrightarrow 175 - 65 = 110$$
$$\longrightarrow 145 - 110 = 35$$

Assessment

Give pupils the question 2 for application activity 13.3 and mark pupils' works.

Answers for activities

Answer for activity 13.3.2

a) $235 - 45 = 540 - 350$

c) $430 - 180 = 320 - 70$

b) $725 - 135 = 600 - 10$

d) $978 - 435 = 763 - 220$

Answer for activity 13.3.3

Question 1

a) $685 - 175 = 1380 - 870$

c) $1037 - 459 = 897 - 319$

b) $185 - 75 = 485 - 375$

d) $1765 - 975 = 1785 - 995$

Question 2

a) $456 - 190 = 564 - 298$

c) $667 - 345 = 856 - 534$

b) $975 - 686 = 721 - 432$

d) $768 - 548 = 729 - 509$

Answer for Application activity 13.3

Question 1

a) $1758 + 722 = 1526 + 954$

c) $1546 + 647 = 1208 + 985$

b) $398 + 575 = 215 + 758$

d) $2801 + 1267 = 2567 + 1501$

Question 2

a) $765 - 348 = 622 - 205$

c) $1567 - 1198 = 2018 - 1649$

b) $1234 - 978 = 981 - 725$

d) $1453 - 832 = 1519 - 898$

Lesson 4: Concept of equality of two expressions with multiplication or division

a) Objectives

Find a missing number in an equality of expressions involving multiplication or division.

b) Teaching and Learning resources

Table of place values, abacus, number cards, Manila paper.

c) Teaching and Learning Activities

Step 1: Equality of two products (with multiplication)

- Guide pupils to do activities on equality whose members are made of the product of two factors;
- Delete one factor and ask pupils to establish how they can calculate that missing factor (use the example of **activity 13.3.5**);

a)	$6 \times 5 = \bullet \times 3$	\longrightarrow	$6 \times 5 = 30$	\longrightarrow	$30 \div 3 = 10$
b)	$4 \times 12 = 8 \times \bullet$	\longrightarrow	$4 \times 12 = 48$	\longrightarrow	$48 \div 8 = 6$
c)	$3 \times \bullet = 20 \times 6$	\longrightarrow	$20 \times 6 = 120$	\longrightarrow	$120 \div 3 = 40$
d)	$\bullet \times 9 = 45 \times 4$	\longrightarrow	$45 \times 4 = 180$	\longrightarrow	$180 \div 9 = 20$

- Form groups and ask pupils to do activities on equality involving multiplication (**Activity 13.3.5**);
- Invite pupils to a whole class discussion on findings.

Summary

Guide pupils to summarize the steps they follow when finding a missing factor: multiply two factors of the first member and you divide their product by the remaining factor for the other member of the equality.

$$6 \times 5 = \underline{\quad} \times 3. \quad \text{Given that } 6 \times 5 = 30, \text{ the missing number is } 30 \div 3 = 10$$

$$6 \times 5 = 10 \times 3$$

Assessment

Assign pupils to work on the first question of the **application activity 13.3.3**; Then mark their work.

Answers for activities

Activity 13.3.5

Question 1

a) $9 \times 18 = 6 \times 27$

c) $21 \times 7 = 49 \times 3$

b) $36 \times 4 = 9 \times 16$

d) $120 \times 5 = 75 \times 8$

Question 2

a) $25 \times 8 = 100 \times 2$

c) $125 \times 4 = 100 \times 5$

b) $45 \times 8 = 6 \times 60$

d) $135 \times 9 = 27 \times 45$

Step 2: Equality of two quotients (with division)

- Guide pupils to do activities on equality whose members are made of the quotient of dividends by divisors;
- Delete one term and ask pupils to establish how they can calculate that missing term (use the example of **activity 13.3.6**);
- Form groups and ask pupils to do activities on equality involving division (**Activity 13.3.6**);
- Invite pupils to a whole class discussion to present findings.

Summary

- Guide pupils to summarize the steps they follow when finding a missing factor:
When the missing number is a dividend, you divide two numbers of the other member of the equality and you multiply its quotient by the remaining number of the second member.

a) $\bullet \div 5 = 225 \div 3 \longrightarrow 225 \div 3 = 75 \longrightarrow 75 \times 5 = 375$

Therefore, $375 \div 5 = 225 \div 3$

When the missing number is a divisor, you divide two numbers of the other member of the equality and you divide the dividend of the other member by the obtained quotient.

b) $120 \div \bullet = 45 \div 9 \longrightarrow 45 \div 9 = 5 \longrightarrow 120 \div 5 = 24$

Therefore, $120 \div 24 = 45 \div 9$

Assessment

Assign pupils to work on the second question of the **application activity 15.3.3** and mark their work.

Answers for activities

Activity 13.3.6

Question 1

a) $824 \div 8 = 412 \div 4$

b) $4536 \div 9 = 2\ 016 \div 4$

c) $945 \div 9 = 315 \div 3$

d) $2\ 828 \div 7 = 2\ 020 \div 5$

Question 2

a) $808 \div 8 = 404 \div 4$

b) $581 \div 7 = 498 \div 6$

c) $918 \div 9 = 306 \div 3$

d) $620 \div 5 = 992 \div 8$

Application activity 15.5.3

Question 1

a) $420 \times 7 = 35 \times 84$

b) $105 \times 89 = 5 \times 1\ 869$

c) $3 \times 228 = 76 \times 9$

d) $5 \times 1\ 794 = 138 \times 65$

Question 2

a) $2\ 925 \div 9 = 1\ 950 \div 6$

b) $872 \div 8 = 436 \div 4$

c) $2464 \div 8 = 2772 \div 9$

d) $12 \div 4 = 9 \div 3$

Lesson 5: Finding the missing number in an increasing number pattern

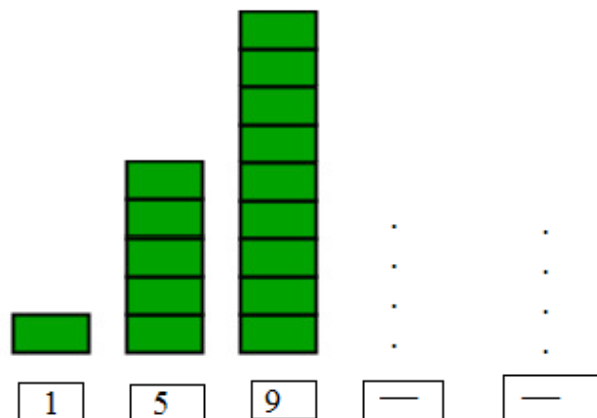
a) **Objectives:** Find the missing number in an increasing number pattern

b) **Teaching and Learning resources**

Multiplication table, abacus, number cards, manila paper, counters or small bricks.

c) **Teaching and Learning Activities**

- Guide pupils to make piles of small bricks or small counters in an increasing order. Form the first pile and guide them to form the second pile by adding 4 counters on the number of the first pile. Use **activity 13.6.1**



- Tell them that the number 4 is called the common difference
- Ask them to make other pile and then form the number pattern of the number of bricks for piles. Help them to discover that the number of bricks is increasing by adding 4.
- Guide pupils to follow the example of **activity13.6.2** on how to find the common difference of a given number pattern.
- Assign pupils to answer to questions of **activity13.6.2** and find the common difference and complete other terms of each number pattern;
- Invite pupils for the whole class discussion to present groups' findings.

Summary

- Guide pupils to summarize the steps they follow when finding a missing number of an increasing number pattern:
 - First calculate the common difference: subtract the first number from the second number
 - Second, add the common difference to the number to find the next number.

Assessment

Assign learners to do the **application activity 13.6.1**. Mark their work and act accordingly.

d) Answers for activities

Common difference in ascending (increasing) number pattern

Activity 13.6.1

Question 1

- a) 855, 1 355, 1 855, Common difference is $1\ 355 - 855 = 500$
 b) 205, 505, 805,1105 Common difference is $505 - 205 = 300$

Question 2

- a) 295, 333, 371, 409 Common difference is $333 - 295 = 38$
 b) 178, 299, 420,441 Common difference isi $299 - 178 = 121$

Application activity 13.6.1

- a) 397, 630, 863, 1096 Common difference is $630 - 397 = 233$
 b) 524, 700,876, 1052 Common difference is $700 - 524 = 176$

Lesson 6: Finding the missing number in a decreasing number pattern

a) Objectives: Find the missing number in a decreasing number pattern

b) Teaching and Learning resources

Multiplication table, abacus, number cards, Manila paper, counters or small bricks.

c) Teaching and Learning Activities

- Guide pupils to make piles of small bricks or small counters in a decreasing order. Form the first pile and guide them to form the second pile by removing 2 counters on the number of the first pile. Use **activity 13.6.3**
- Tell them that the number 2 of bricks taken away to get the number of bricks for the next pile is called the common difference.
- Ask them to make other piles and then form the number pattern of the number of bricks for piles. Help them to discover that the number of bricks is decreasing by removing 2.
- Guide pupils to follow the example of **activity 13.6.4** on how to find the common difference of a given number pattern.
- Assign pupils to answer to questions of **activity 13.6.4** and find the common difference and complete other terms of each number pattern;
- Invite pupils for the whole class discussion to present groups' findings.

Summary

- Guide pupils to summarize the steps they follow when finding a missing number of a decreasing number pattern:
 - First calculate the common difference: subtract the second number from the first number
 - Second, subtract the common difference from the number to find the next number.

Assessment

Assign learners to do the **application activity 13.6.2**. Mark their work and act accordingly.

d) Answers for activities

Common difference in a descending (decreasing) number pattern

Activity 13.6.3

Question 1

- a) 2 456, 2 306, 2 156, Common difference is $2\ 456 - 2\ 306 = 150$
- c) 4 032, 3 957, 3 882, Common difference is $4\ 032 - 3\ 957 = 75$
- b) 1 890, 1 751, 1 612, Common difference is $1\ 890 - 1\ 751 = 214$
- d) 2 476, 3 000, 3 524, Common difference is $3\ 000 - 2\ 476 = 524$

Question 2

- a) 2 018, 1 653, 1 288, 923 Common difference is $2\ 018 - 1\ 653 = 365$
- b) 956, 878, 800, 722 Common difference is $956 - 878 = 78$

Application activity 13.6.2

- a) 1 519, 1 470, 1 421, Common difference is $1\ 519 - 1\ 470 = 49$
- b) 976, 937, 898, 859 Common difference is $976 - 937 = 39$
- c) 789, 691, 593, 495 Common difference is $789 - 691 = 98$

Lesson 6: Finding the missing number in number pattern

a) Objectives: Find the missing number in a number pattern

b) Teaching and Learning resources

Multiplication table, abacus, number cards, Manila paper, counters or small bricks.

c) Teaching and Learning Activities

- Guide pupils to observe a number pattern and verify if it is increasing or decreasing. Then, they find the common difference. Use example of **activity 13.6.5**
- Ask them to recall how to find the common difference and the next number of a number pattern
 - a) When it is an increasing number pattern,
 - b) When it is a decreasing number pattern..
- Guide pupils to follow the example of **activity 13.6.5** on how to find the missing number of a given number pattern.
- Assign pupils to answer to questions of **activity 13.6.5** and find the common difference and complete other terms of each number pattern;
- Invite pupils for the whole class discussion to present groups' findings.

Summary

Guide pupils to summarize the steps they follow when finding a missing number of a number pattern.

Assessment

Assign learners to do the **application activity 13.6.3**. Mark their work and act accordingly.

d) Answers for activities

Activity 13.6.5

- a) 4 256, 4 365, 4 474, 4 583, 4 692, 4 801 Common difference is $4\ 365 - 4\ 256 = 109$
b) 1 994, 2 018, 2 042, 2 066, 2 090, 2 114 Common difference is $2\ 018 - 1\ 994 = 24$
c) 1 897, 1 950, 2 003, 2 056, 2 109, 2 162 Common difference is $1\ 950 - 1\ 897 = 53$
d) 7 564, 6 614, 5 664, 4 714, 3 764, 2 814 Common difference is $7\ 564 - 6\ 614 = 950$
e) 4 000, 4 500, 5 000, 5 500, 6 000, 6 500 Common difference is $4\ 500 - 4\ 000 = 500$
f) 3 480, 3 505, 3 530, 3 555, 3 580, 3 605 Common difference is $3\ 505 - 3\ 480 = 25$

Application activity 13.6.3

- a) 5 469, 4 679, 3 889, 3 099, 2 309, 1 519 Common difference is $5\ 469 - 4\ 679 = 790$
b) 4 325, 3 875, 3 425, 2 975, 2 525, 2 075 Common difference is $4\ 325 - 3\ 875 = 450$

13.6. Ending points of the Unit

a) Summary of unit content

As a teacher, you should prepare the summary on how to find the missing number in number sentences with addition, subtraction, multiplication and division.

This may include also the missing number in equalities and number patterns.

b) Answers for the end unit assessment 13

1) Find the missing number

$$\begin{array}{r} \text{a)} \quad 1\ 7\ 8\ 7 \\ + \quad 6\ 1\ 1\ 2 \\ \hline 7\ 8\ 9\ 9 \end{array}$$

$$\begin{array}{r} \text{d)} \quad 1\ 5\ 8 \\ \quad \times 8 \\ \hline 1264 \end{array}$$

$$\begin{array}{r} \text{g)} \quad 2\ 9\ 8\ 7 \\ - \quad 1\ 3\ 7\ 6 \\ \hline 1\ 6\ 1\ 1 \end{array}$$

$$\begin{array}{r} \text{b)} \quad 2\ 4\ 3 \\ \quad \times 9 \\ \hline 2187 \end{array}$$

$$\begin{array}{r} \text{c)} \quad 7\ 9\ 5\ 6 \\ - \quad 1\ 5\ 3\ 4 \\ \hline 6\ 4\ 2\ 2 \end{array}$$

$$\begin{array}{l} \text{h)} \quad 3612 \div 4 = 903 \\ \text{i)} \quad 1575 \div 5 = 315 \\ \text{j)} \quad 1678 \div 2 = 839 \end{array}$$

$$\begin{array}{r} \text{c) } 4355 \\ + 3941 \\ \hline 8296 \end{array}$$

$$\begin{array}{r} \text{f) } 179 \\ \times 6 \\ \hline 1074 \end{array}$$

$$\text{k) } 1326 \div 6 = 221$$

2) Fill these equalities with the missing number

$$\text{a) } 100 + 50 = 80 + 70$$

$$\text{d) } 9 \times 8 = 18 \times 4$$

$$\text{b) } 525 - 200 = 400 - 75$$

$$\text{e) } 25 \times 2 = 10 \times 5$$

$$\text{c) } 978 - 435 = 763 - 220$$

$$\text{f) } 728 \div 8 = 364 \div 4$$

3) Find the common difference in these sequences:

$$\text{a) } 19 \quad \text{b) } 255 \quad \text{c) } 79 \quad \text{d) } 36 \quad \text{e) } 63 \quad \text{f) } 24$$

4) Fill the missing numbers in the sequence:

$$\text{a) } 1250, 1750, 2250, 2750, 3250 \quad \text{b) } 3400, 3100, 2800, 2500, 2200$$

$$\text{c) } 2525, 3025, 3525, 4025, 4525,$$

c) Remedial activities

Find the missing number

$$\begin{array}{r} \text{a) } 2 \bullet \bullet 0 \\ + 142 \\ \hline 2842 \end{array}$$

$$\begin{array}{r} \text{b) } 3568 \\ - \bullet \bullet \bullet \bullet \\ \hline 1457 \end{array}$$

$$\begin{array}{r} \text{c) } 3568 \\ \times 3 \\ \hline \bullet \bullet \bullet \bullet \end{array}$$

$$\text{d) } 842 \div \bullet = 421$$

Answers:

$$\begin{array}{r} \text{a) } 2700 \\ + 142 \\ \hline 2842 \end{array}$$

$$\begin{array}{r} \text{b) } 3568 \\ - 2111 \\ \hline 1457 \end{array}$$

$$\begin{array}{r} \text{c) } 3568 \\ \times 3 \\ \hline 6633 \end{array}$$

$$\text{d) } 842 \div 2 = 421$$

d) Extended activities

1) find the missing number

$$\begin{array}{r} \text{a) } 9 \bullet 15 \\ + 3 \bullet 6 \\ \hline 9801 \end{array}$$

$$\begin{array}{r} \text{e) } 9 \bullet 15 \\ - \bullet 3 \bullet 4 \\ \hline 1221 \end{array}$$

$$\text{b) } 975 + 899 = \bullet + 926$$

$$\text{c) } 148 \times 7 = \bullet \times 4$$

$$\text{d) } 864 \div 8 = \bullet \div 6$$

2) Fill in the missing numbers in the number pattern

a) 7 535, 7 405, 7 365, ..., ...

b) 9 876, 9 444, ... , ...

Answers

$$\begin{array}{r} \text{a)} \quad 9\ 4\ 1\ 5 \\ \quad \quad \underline{+ 3\ 8\ 6} \\ \quad \quad 9\ 8\ 0\ 1 \end{array}$$

$$\begin{array}{r} \text{b)} \quad 9\ 6\ 1\ 5 \\ \quad \quad \underline{- 8\ 3\ 9\ 4} \\ \quad \quad 1\ 2\ 2\ 1 \end{array}$$

b) $975 + 899 = 948 + 926$

c) $148 \times 7 = 259 \times 4$

d) $864 \div 8 = 648 \div 6$

2) Fill in the missing numbers in the number pattern

a) 7 535, 7 405, 7 365, 7 236, 7 105.

b) 9 876, 9 444, 9 012, 8 580.

UNIT 14 PICTOGRAPHS

14.1. Key unit competence

Analyze and describe the information read on a pictograph

14.2. Prerequisites

Describing and interpreting various pictographs showing the number of objects as it was learnt in P2.

14.3. Cross cutting issues to be addressed

Peace and value education: when a pupil works with others in agreed manner without disrupting or disturbing others;

14.4. List of sub-topics/lessons of this unit

UNIT 14 :ANALYZE AND DESCRIBE THE INFORMATION READ ON A PICTOGRAPH (8 Periods)				Reinforcement and Extension
	Lesson title	Learning objectives	Number of periods	
1	Introductory activity	Arouse the curiosity of learners on the importance to analyze and describe the information read on a pictograph.	1	
2	Numbers of objects on a pictograph	Count and tell number of object found on pictograph.	1	
3	Finding and representing the number of objects on a pictograph	Represent and count objects in a pictograph.	1	1
4	Drawing a pictograph with the given information or objects	Draw a pictograph with the given information or objects.	2	1
5	Unit assessment	Analyze and describe the information read on a pictograph	1	
	Total		6	2

14.5. Guidance on the teaching of different lessons for unit 14

Lesson 1: Guidance on the introductory activity 14

- Invite pupils to read a short story of 2 children who visited the car shop for their father. The 2 children do not understand the role of pictures used by their father to record daily data.
- Let the class discuss the story and give views on the role of that pictographs
- Ask pupils to discuss how pictographs are made, how to put objects on pictographs.
- Basing on their answers, arouse the curiosity of pupils by telling that the correct answers and explanations will be provided in this unit.

Lesson 2: Recording the number of objects from a pictograph



























































a) **Objectives:** Recording the number of objects from a pictograph.

b) Teaching and Learning resources

Different types of counters with different colors, Manila paper, etc.

c) Teaching and Learning Activities

- Guide pupils to recall how objects are arranged on a pictograph (vertically and horizontally).

10									
9									 pawpaw
8									 pumpkin
7									 carrot
6									 carrot
5									 banana
4									 cabbage
3									 tomato
2									 tomato
1									 mango

- Guide pupils to do activities on how to name different groups of objects and tell the number of each group of objects on a pictograph (**activity 14.1.1**);
- Invite pupils to a whole class discussion to present groups' findings.

Summary

Guide pupils to summarize how objects are arranged on a pictograph and how to get information from it:

- Each column has the same type of objects,
- different columns have different types of objects;
- the number of each type is counted vertically in each column,
- the number of types of objects are counted horizontally and their number equals to the number of columns.

Assessment

Give pupils **Application activity 14.1**. Mark their work.

Lesson 2: Representation of objects on a pictograph

a) Objectives: Represent objects on a pictograph

b) Teaching and Learning resources

Manila paper, different counters with different colors.

c) Teaching and Learning Activities

- Guide pupils to recall how objects are arranged on a pictograph and how to get information from it;
- Form groups of pupils and refer to **activity14.2.1** where you give each group different counters (objects) where the number of each type is known and ask pupils to:
 - 1) Organize each group of objects apart and count their number,
 - 2) Draw a pictograph on a squared manila paper put on the table or the floor,
 - 3) Portray those groups of objects on a pictograph
- Move around to each group to provide support with probing questions where necessary to bring them on the track;
- Guide the whole class to move from the work for each group to another to see how they worked and help them to harmonize it.

Summary

Guide pupils to summarize the steps they follow when completing objects on a pictograph (see the previous lesson)

Assessment

Make small pieces of paper with pictographs, put them in a box and ask each pupil to pick one paper, observe it and explain the number of each type of objects that appear on the pictograph.

Lesson 3: Making a pictograph with the given information or objects

a) Objectives: Draw a pictograph with the given information

b) Teaching and Learning resources

Manila paper, different counters with different colors.

c) Teaching and Learning Activities

- Guide pupils to recall how objects are arranged on a pictograph;
- Form groups of pupils and assign them **Activity 14.2.3** where you give each group different counters (objects) where the number of each type is known and ask pupils to: organize each group of object apart and then portray those groups of objects using a pictograph that they are going to **draw on a manila paper**;
- Move around to each group to provide support with probing questions where necessary to bring them on the track;
- Invite each group to show and explain their work and guide the whole class to harmonize it.

Summary

Guide pupils to summarize the steps they follow when putting objects on a pictograph (see the previous lessons):

- Each column has the same type of objects,
- different columns have different types of objects;
- the number of each type is counted vertically in each column,

Assessment

Assign pupils the application **activity 14.2** to be done in pairs and mark their work.

Note:

If you do not have counters of the types found in the book, you can use other objects found in the school environment. You can also guide pupils how to use counters' names for example dog 1, dog 2, dog 3, dog 4 in **activity 14.2.3** and shirt 1, shirt 2 in the **application activity 14.2**.

Answers to activities**Activity 14.1.1**

- 8 Pawpaw – 9 Bananas – Carrots –10 Apples
- 7 Pumpkins – 6 Cabbages – 5 Tomatoes

Application activity 14.1.1

- 6 small combs – 8 small jugs
- 9 small brushes – 7 small pumpkins
- 12 pineapples – 10 avocados
- 11 eggs

Activity 14.2.2





























- A) – 4 yellow shirts – 7 dresses
- 6 green shirts – 5 pairs of trousers
- 4 skirts – 3 paint brushes
- 8 raincoats
- B) 5 goats, 3 caterpillars, 6 bees, 2 crocodiles 7 cockroaches, 4 butterflies, 9 dogs.

14.6. Ending points of unit 14**a) Summary of the unit content**

The teacher should have the summary on how to analyze and explain the information provided by a pictograph.

b) Answers to the end unit assessment 14

Answers are different depending on how each pupil answers the questions 1, 2 and the 3rd














7							
6							
5							
4							
3							
2							
1							

This pictograph contains:

- 3 coins of 100 Frw
- 6 bicycles
- 5 weighing scales
- 7 measuring tapes
- 2 wall clocks
- 1 roll
- 4 coke drinks

c) Remedial activities

Use a grid to draw 4 circles, 7 squares and 2 rectangles

7			
6			
5			
4			
3			
2			
1			

d) Extension activities

Use a pictograph to draw

- a) 4 cows, 5 rats, 7 chickens, 8 dogs
- b) 3 bananas, 6 oranges, 9 pineapples

END OF YEAR ASSESSMENT

A. Numbers

1) Write in figures or in words the following:

a) Nine thousand three hundred and eighteen: ____

b) 7 546: ____

c) Five thousand seven hundred and forty-three: ____

d) 6 978: ____

2) Write the following number in the table of place value

a) 5 478

b) 7 231

c) 9 768

3) Which number has been expanded below?

a) 7 thousands 6 hundreds 5 tens 8 ones = ____

b) 9 thousands 6 tens 7 ones = ____

c) 6 thousands 9 hundreds 3 tens 4 ones = ____

4) Compare numbers using $<$, $>$ and $=$

a) 7 865 7 685

c) 8 798 8 798

b) 9 456 9 546

d) 5 798 5 987

5) Arrange numbers in ascending order

a) 5 768, 5 678, 5 786, 5 687

b) 8 769, 8 796, 8 976, 8 967

6) Arrange numbers in descending order

a) 6 435, 6 354, 6 453, 6 345

b) 9 567, 9 675, 9 576, 9 657

7) Add:

a) $5\,785 + 2\,957 =$

b) $4\,678 + 5\,099 =$

8) Subtract:

a) $9\,123 - 7\,987 =$

b) $8\,005 - 5\,678 =$

c) $7\,234 - 6\,789 =$

9) Multiply:

a) $82 \times 65 =$ b) $154 \times 45 =$ c) $256 \times 38 =$

10) Divide:

a) $7\ 896 \div 4 =$ b) $8469 \div 9 =$ c) $9\ 891 \div 7 =$

11) Fill in the missing numbers

a) $__ + 5\ 678 = 9\ 876$

b) $8 \times __ = 6\ 312$

c) $8\ 567 - __ = 2\ 789$

d) $4\ 567 + 3\ 578 = __ + 5\ 986$

e) $6\ 754 - __ = 7\ 523 - 5\ 398$

f) $__ \div 5 = 7\ 000 \div 8$

12) Find the common difference of the following number pattern.

a) 987, 1 092, 1 197, 1 302

b) 875, 780, 685, 590

13) Fill in the blanks with the correct numbers

a) 1 543, 1 474, 1 405, 1 336, $______,$ $______,$ $______$

b) 2 675, 2 500, 2 325, 2 150, $______,$ $______,$ $______$

14) Fill in the missing numbers in the following table

\downarrow	0	1	2	3	4	5	6	7	8	9	10
$\times 7$											
\downarrow	0	1	2	3	4	5	6	7	8	9	10
$\times 8$											
\downarrow	0	1	2	3	4	5	6	7	8	9	10
$\times 9$											

15) Read and find the answer

a) Equally divide 9 875 mosquito nets to 5 sectors and find the number of mosquito nets to be received by each sector.

b) Bibare cell has the following data of citizens: 1 368 men, 1 579 women and 6 487 children . Find the total number of citizens in Bibare cell.

c) Our sector planted 8 764 eucalyptus seedlings and only 7 985 seedlings grew up. Find the number of seedling which did not grow.

d) In the small stadium there are 1 009 rows of chairs and on each row there are 9 people who are well seated . Find the total number of people in the stadium.

B) Measurements and Rwandan currency

1) What is the standard unit of the following measurements?

- a) Length measurements c) capacity measurements
- b) Mass measurements

2) Work out the following:

$$5\text{kg } 80\text{ g} = \dots\text{dag}$$

$$8\text{ l } 30\text{ cl} = \dots\text{dl}$$

$$5\text{ m } 9\text{ cm} = \dots\text{mm}$$

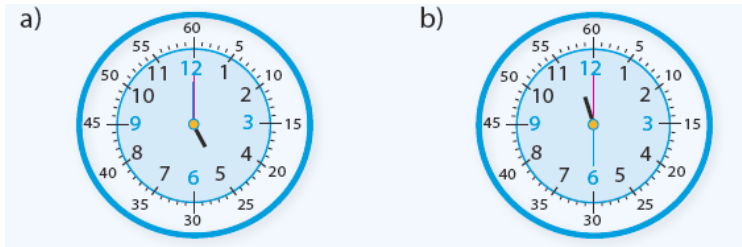
3) Use the conversion table to work out the following

- a) $225\text{ c}\ell \times 8 = \dots\ell$
- b) $8\text{km} \times 6 = \dots\text{hm}$
- c) $578\text{ dag} \times 5 = \dots\text{ hg}$
- d) $7\,200\text{ c}\ell \div 9 = \dots\ell$
- e) $8\text{ km} : 6 = \dots\text{ m}$
- f) $7\text{ kg} \div 7 = \dots\text{g}$
- g) $80\text{ d}\ell + 120\text{m}\ell = \dots\ell$
- h) $75\text{ hm} + 2\,250\text{ dam} = \dots\text{dam}$
- i) $59\text{ hg} + 286\text{ dag} = \dots\text{ g}$
- j) $9\text{ hm} - 49\text{ dam} = \dots\text{ m}$
- k) $68\text{ d}\ell - 3\,800\text{ m}\ell = \dots\ell$
- l) $6\text{ kg} - 5\,678\text{ g} = \dots\text{g}$

4) Work out the following

- a) 9 notes of 1 000 Frw = 2 000 Frw + ...Frw
- b) Take the biggest note of Rwandan currency, the smallest note of Rwandan currency and two big coins of Rwandan currency. What will be their sum?
- c) Suppose you are given 2 notes of 5000 Frw and you are requested to buy 1kg of sugar at 1 200 Frw, bread at 900 Frw, salt at 400 Frw, soap at 950 Frw, 1 kg of rice at 800 Frw and wheat flour at 1 500 Frw. What will be your balance?

5) Tell the time. ?



6) Convert the following:

- a) 4 years =months.
- b) 8 weeks =days
- c) 30 days =....hours
- d) 35 days =weeks

7) Explain the difference between the year with 365days and the year with 366days.

8) Kagabo used a wheelbarrow to transport 2 700 kg of Irish potatoes to the market and he did it 9 times. Find the number of kg of Irish potatoes he carried at once.

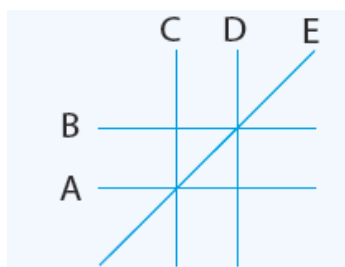
9) Mahoro has 8 small jellycans which contains 5 liter each. Find the total number of litres she has.

10) How many days will each of the following years have?

- a) 2 018 b) 2 019 c) 2 020 d) 2 024

C. Geometric figures

1) Study the picture and give names of different lines:



- a) A and B are.....
- b) C and B are.....
- c) D and E are.....
- d) A and E are.....
- e) B and E are.....
- f) A and D are.....
- g) B and D are.....
- h) C and D are.....

2) Complete the the tables below:

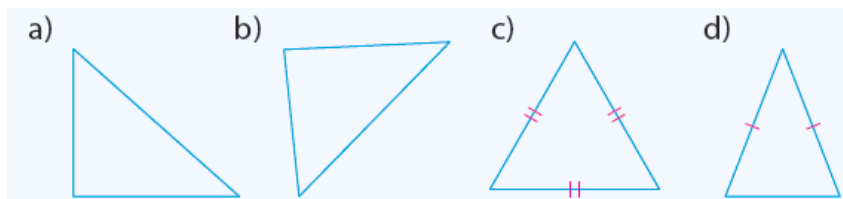
A) Square

Length of the side	Perimeter
45 cm	
	240 cm
105 cm	
	840cm
78 cm	
	960cm
M	

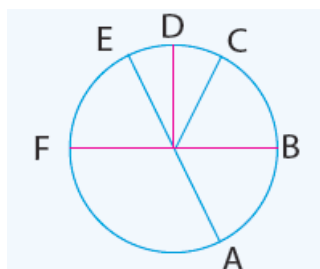
B) Rectangle

Length	Width	Perimeter
75 cm	54 cm	
23 cm	17 cm	
56 cm	43 cm	
87 cm	67 cm	
93cm	79 cm	
36cm	25 cm	
69 cm	47 cm	

3) Name the following triangles

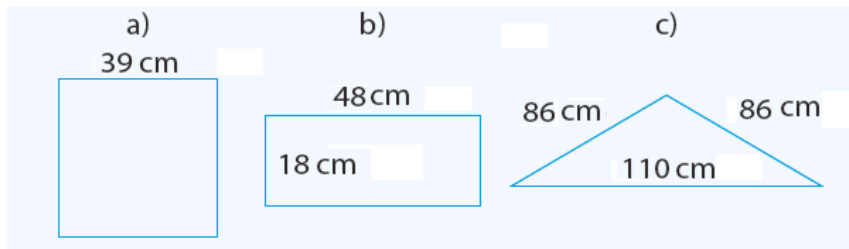


4) Study the image and name all segments on the circle

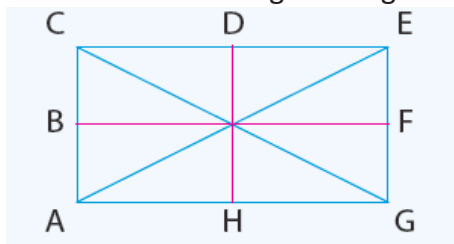


- a) AE is.....
- b) OB is.....
- c) FD is.....
- d) OC is.....
- e) OD is.....
- f) OA is.....
- g) OF is.....
- h) OE is.....

- 5) Find the perimeter of a square with 45cm of side.
- 6) Find the perimeter of a rectangular piece land of 89 cm of width and 121 cm of length.
- 7) Find the perimeter of an equilateral triangle with 18 cm of side.
- 8) Find the perimeter of the following shapes



- 9) Observe the following rectangle and name the given segments



- | | | | |
|---------|---------|---------|---------|
| a) AC = | c) AG = | e) AE = | g) GE = |
| b) CG = | d) BF = | f) HD = | h) CE = |

- 10) Draw a grid of 8 horizontal lines and 8 vertical lines:
 - a) Plot the following dot points A (3, 6) B (6, 7) C (3, 3) D (7, 3)
 - b) What is the name of the shape formed?
 - c) Use a protractor to measure its angles.
- 11) Draw the following angles: 60° and 135°
- 12) Place the following objects on a pictograph
 - a) 6 balls
 - b) 7 cars
 - c) 2 oranges
 - d) 9 shoes
 - e) 10 T-shirts

ANSWERS FOR THE END YEAR ASSESSMENT

A. Numbers

1) a) 9 318

b) Seven thousand, five hundred forty six

c) 5 743

d) Six thousand, nine hundred seventy eight

2.

TH	H	T	O
5	4	7	8
7	2	3	1
9	7	6	8

3. a) 7 658 b) 9 067 c) 6 934

4. a) $7\ 865 > 7\ 685$ b) $9\ 456 < 9\ 546$ c) $8\ 798 = 8\ 798$

d) $5\ 798 < 5\ 987$

5. a) 5 678, 5 687, 5 768, 5 786 b) 8 769, 8 796, 8 967, 8 976,

6. a) 6 453, 6 435, 6 354, 6 345 b) 9 675, 9 657, 9 576, 9 567

7. a) $5\ 785 + 2\ 957 = 8\ 742$ c) $3\ 987 + 5\ 765 = 9752$

b) $4\ 678 + 5\ 099 = 9\ 777$

8. a) $9\ 123 - 7\ 987 = 1136$ b) $8\ 005 - 5\ 678 = 2\ 327$

9. a) $82 \times 65 = 5330$ b) $154 \times 45 = 6\ 930$ c) $256 \times 38 = 9728$

10. a) $7896 \div 4 = 1974$ b) $8769 \div 9 = 941$ c) $9891 \div 7 = 1413$

$\begin{array}{r} 1974 \\ 4 \overline{) 7896} \\ \underline{-4} \\ 38 \\ \underline{-36} \\ 029 \\ \underline{-28} \\ 016 \\ \underline{-16} \\ 00 \end{array}$	$\begin{array}{r} 941 \\ 9 \overline{) 8469} \\ \underline{81} \\ 036 \\ \underline{-36} \\ 009 \\ \underline{-9} \\ 0 \end{array}$	$\begin{array}{r} 1413 \\ 7 \overline{) 9891} \\ \underline{-7} \\ 28 \\ \underline{-28} \\ 009 \\ \underline{-7} \\ 21 \\ \underline{-21} \\ 00 \end{array}$
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11. a) $4\,198 + 5\,678 = 9876$ e) $4567 + 3578 = 2159 + 5986$
 b) $8 \times 789 = 6312$ f) $6754 - 4629 = 7523 - 5398$
 c) $8567 - 5\,778 = 2789$ g) $564 \times 8 = 9 \times 448$
 d) $9785 : 1\,957 = 5$ h) $4375 : 5 = 7000 : 8$

12) a) common difference is $+105$ b) common difference is 95

13) a) 1543 , 1474, 1405, 1336, 1267, 1198

b) 2675, 2500, 2325, 2150, 1975, 1800

$\sqrt{\quad}$	0	1	2	3	4	5	6	7	8	9	10
$\times 7$	0	7	14	21	28	35	42	49	56	63	70
$\sqrt{\quad}$	0	1	2	3	4	5	6	7	8	9	10
$\times 8$	0	8	16	24	32	40	48	56	64	72	80
$\sqrt{\quad}$	0	1	2	3	4	5	6	7	8	9	10
$\times 9$	0	9	18	27	36	45	54	63	72	81	90

- 15) a) Those who will receive mosquito nets u $9\,875 : 5 = 1\,975$
 b) The total population of Bibare Cell: $1\,368 + 1\,579 + 6\,487 = 9\,434$.
 c) Those that did not grow $8\,764 - 7\,985 = 779$
 d) Number of people who fit it : $1\,009 \times 9 = 9\,081$

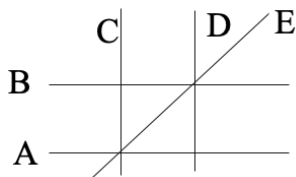
B. Measurements

- 1) a) Meter (m) b) Kilogram (kg) c) Liter
- 2) a) $5\text{kg } 80\text{g} = 508\text{dag}$ b) $8\text{ l } 30\text{cl} = 83\text{dl}$ c) $5\text{m } 9\text{cm} = 5\,090\text{ mm}$
- 3) a) $225\text{cl} \times 8 = 18\text{ l}$ h) $75\text{hm} + 2250\text{dam} = 3\text{km}$
 b) $8\text{km } 50\text{dam} \times 6 = 510\text{hm}$ i) $59\text{hg } 8\text{g} + 286\text{dag} = 8\,760\text{ g}$
 c) $578\text{dag} \times 5 = 289\text{hg}$ j) $9\text{hm } 8\text{ m} - 49\text{dam } 9\text{m} = 409\text{m}$
 d) $7200\text{cl} : 9 = 1\,80$ k) $68\text{ dl} - 3800\text{ml} = 3\text{ l}$
 e) $\text{km } 8\text{ m } 4 : 6 = \text{m } 1334$ l) $6\text{kg } 8\text{dag} - 5678\text{g} = 402\text{g}$
 f) $7\text{ kg } 7\text{dag} : 7 = 1010\text{g}$
 g) $80\text{dl} + 120\text{ml} = 2\text{ l}$
- 4) a) $9\,000\text{ Frw} = 2\,000\text{ Frw} + 5\,000\text{ Frw} + 2\,000\text{ Frw}$
 b) $5\,000\text{ Frw} + 500\text{ Frw} + 200\text{ Frw} = 5\,700\text{ Frw}$
 c) I would pay $1\,200\text{ Frw} + 900 + 400\text{ Frw} + 950\text{ Frw} + 800\text{ Frw} + 1\,500\text{ Frw} = 5\,750\text{ Frw}$
 The balance would be $= 10\,000\text{ Frw} - 5750\text{ Frw} = 4250\text{ Frw}$

- 5) a) 6 pm c) 11:30 am
 b) 08:45 am
- 6) a) 4 years have 208 months c) 30 days equal 720 hours
 b) 8 weeks equal to 56 days d) 35 days are equal to 5 weeks
- 7) A year that has 365 days has a month of February with 28 days; A year with 366 days has a month of February with 29 days.
- 8) He would carry 2700 kg: $9 = 300$ kg
- 9) The amount of water is $5 \text{ l} \times 8 = 40 \text{ l}$
- 10) How many days will the following years have?
- | | |
|--------------------|-------------------|
| a) 2018 : 365 days | d) 2024: 366 days |
| b) 2019 : 365 days | e) 2030: 365 days |
| c) 2020 : 366 days | f) 2028: 366 days |

C. Geometric shapes

- 1) Observe and tell the names of the different lines :



- a) A and B are parallel lines
- b) C and B are intersecting lines making right angles
- c) D and E are intersecting lines making both an obtuse and acute angles
- d) A and E are intersecting lines making both an obtuse and acute angles
- e) B and E are intersecting lines that make both an obtuse and acute angles
- f) A and D are intersecting lines that form right angles
- g) B and D are intersecting lines that form right angles
- h) C and D are parallel lines

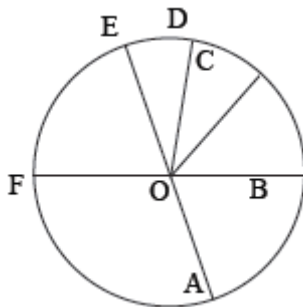
2) Fill in the table

A. Square	
Side	Perimeter
45 cm	180 cm
80 cm	240 cm
105 cm	420 cm
210 cm	840 cm
78 cm	312 cm
240 cm	960 cm
154 cm	616 cm

B. Rectangle		
Length	Width	Perimeter
75 cm	54 cm	258 cm
23 cm	17 cm	80 cm
56 cm	43 cm	198 cm
87 cm	67 cm	308 cm
93 cm	79 cm	344 cm
36 cm	25 cm	122 cm
69 cm	47 cm	

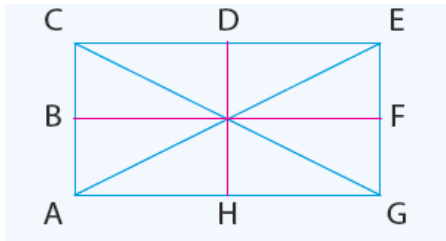
- 3) a) Right Angled triangle b) scalene triangle
 c) Equilateral Triangle d) Isosceles Triangle

4)



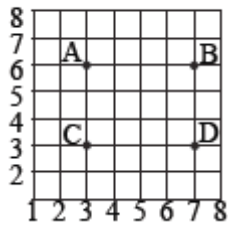
- a) A E is a diameter f) OA is a radius
 b) OB is a radius g) OF a radius
 c) F B is a diameter h) OE is a radius
 d) OC is a radius
 e) OD is a radius
- 5) Perimeter is $45 \text{ cm} \times 4 = 180 \text{ cm}$
 6) Perimeter is $(89 \text{ cm} + 121 \text{ cm}) \times 2 = 420 \text{ cm}$
 7) Perimeter is $18 \text{ cm} \times 3 = 54 \text{ cm}$
 8) a) Perimeter is $39 \text{ cm} \times 4 = 156 \text{ cm}$
 b) Perimeter is $(48 \text{ cm} + 18 \text{ cm}) \times 2 = 132 \text{ cm}$
 c) Perimeter is $86 \text{ cm} + 86 \text{ cm} + 110 \text{ cm} = 282 \text{ cm}$

9) On the figure below



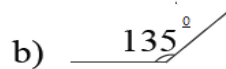
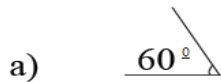
- a) AC is width
- b) CG is diagonal
- c) AG is length
- d) BF is a median
- e) A E is diagonal
- f) HD is a median
- g) GE is width
- h) CE is a length

10) a)



- b) The obtained shape is a rectangle
- c) Its angles measure 90 degrees.

11) The answers are different depending on the angles each one drew



12) The answers will be different depending on the picture each pupil will draw

10					
9					
8					
7					
6					
5					
4					
3					
2					
1					

GLOSSARY

1. **Addition** : Mathematical operation of finding a sum of numbers
2. **Angle**: is a figure which is formed by intersection of two straight lines
3. **Ascending order**: Order in which objects or numbers are arranged from the smallest to the biggest
4. **Coin**: is a small, usually round and flat piece of metal used primarily as a medium of exchange.
5. **Compare**: find similarity or difference between two numbers or objects
6. **Currency**: Money in the form of paper or coins issued by a government and accepted at face value,
7. **Curved line**: A line that is not straight and is bent.
8. **Descending order**: order in which objects or numbers are arranged from the biggest to the smallest
9. **Difference**: the result of subtracting one number from another
10. **Equal**: Having the same value
11. **Exceed**: to be greater than a value or a quantity. For example, if a number “x” exceeds another number “y,” it means that x is greater than y.
12. **Exchange**: to convert from one unit of money to another
13. **Horizontal**: a line perpendicular to a surface or to another line considered as a base
14. **Length**: measurement of how long something / object is
15. **Meter**: A meter is the standard unit of measuring length in the International System of Units (SI)
16. **Money**: coins and notes used to pay for goods and services
17. **Multiple**: is the number you get when you multiply a certain number by an integer. For example, multiples of 5 are: 10, 15, 20, 25, and 30...etc. Multiples of 7 are: 14, 21, 28, 35, 42, and 49...etc.
18. **Multiplication**: is a method of finding the product of two or more numbers;
19. **Number pattern**: A number pattern is a series of numbers that follow a certain rule or order in mathematics;

20. **Order:** to arrange things according to a certain rule;
21. **Place value:** is the position of a digit in a number that determines its value;
22. **Remaining:** Continuing to exist or be left after other parts or things have been used or taken away;
23. **Sequence:** is an ordered list of numbers or objects
24. **Subtraction :** Mathematical operation taking one number away from another;
25. **Take away / to subtract:** To take some objects from a set of many objects;
26. **To shade:** is to hide partly by or as if by a shadow;
27. **Vertical line:** a straight line which goes from top to bottom and bottom to top;
28. **Word problem:** Mathematical problems written in words rather than symbols;

29. Unit 1 key vocabulary or concepts

- **Ones (O):** In set of numbers, Ones is a place value of a digit showing the number of unities.
- **Tens (T):** it is the place value of a digit for a number that shows the number of tens it stands for.
- **Hundreds (H):** it is the place value of a digit for a number that shows the number of hundreds it stands for.
- **Thousands (T):** it is the place value of a digit for a number that shows the number of hundreds it stands for.
- **Decompose a number:** to show the place value for each digit of this number
- **Arrange or order numbers:** To order numbers starting by the smallest to the biggestst or starting by the biggest to the smallest.
- **Sum:** the answer obtained when you add numbers.

Addition:

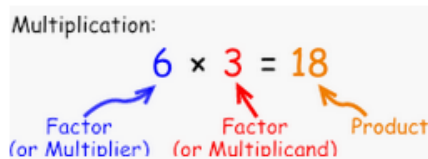
$$8 + 3 = 11$$

- **Difference:** The answer obtained when you subtract a number from another.

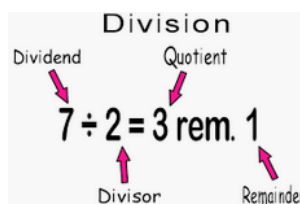
Subtraction:

$$8 - 3 = 5$$

- **Product:** The answer you obtain when you multiply numbers;
- **Multiplicand:** It is the number to be multiplied to find a product of two numbers.
- **Multiplier:** it is a number that multiplies the multiplicand to find a product of two numbers



- **Quotient:** it is the answer obtained when dividing a number by another number
- **Dividend:** it is a number to be divided by another to find the quotient.
- **Divisor:** It is a number used to divide the dividend to find the quotient



30. Unit 2 key vocabulary or concepts

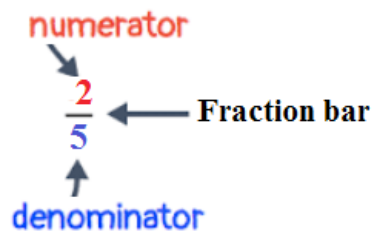
- **Digit:** one of the 10 representations of units: 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9.
- Terms of a subtraction: The Minuend, subtrahend and the difference.
- **Borrow:** to take one unit from the digit of next place value which is equivalent to 10 units such that when added to the current digit of a minuend can make it possible to subtract.
- **To carry:** To reserve one unit to be added to a next place value when adding digits and you find the number greater than 10.
- **Equal sharing:** To share objects to a certain number of people such that they get the same amount of objects.
- **Odd number:** is an integer when divided by two, either leaves a remainder or the result is a fraction.
- **Even number:** Any integer (never a fraction) that can be divided exactly by 2.

31. Unit 3 key vocabulary or concepts

- **Equal sharing:** To share objects to a certain number of people such that they get the same amount of objects.
- **Adding vertically:** use the standard written method to add numbers where numbers are written such that digits of the same value are placed in the same column.

32. Unit 4 key vocabulary or concepts

- **Numerator:** The top number of a fraction
- **Denominator:** The bottom number of a fraction
- **Fractional bar:** a small line separating a numerator and a denominator.
- **A whole :** it is one unit equivalent to a fraction whose numerator equals to a denominator.
- **Proper fraction:** a fraction for which the numerator is less than the denominator.
- **Improper fraction:** a fraction for which numerator is greater than or equal to denominator.
- **Mixed fraction:** a number made by a whole number and a proper fraction.



33. Unit 5 key vocabulary or concepts

Some of the standard instruments used to measure length are a ruler, metre scale, measuring tape, vernier caliper, and screw gauge.



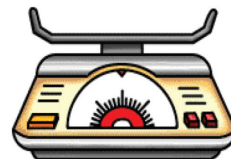
- **Folding metre:** metre scale for a carpenter that can be folded.
- **Measuring tape:** a tape frequently used by taylor.
- **Decametre:** a unit of length measurement equaling to 10 metres.
- **Standard unit:** It is a unit of measurement used internationally where other units are converted to. The standard unit of length measurement is the metre(m).

34. Unit 6 key vocabulary or concepts

- **Spring Balance** This type of balance consists of a highly elastic helical spring of hard steel suspended from a fixed point. The weighing pan is attached at the lowest point of the spring. An indicator shows the weight measurement and no manual adjustment of weights is necessary.



- **Top pan balance:** objects are put on top and the mass is read on the screen.



- **Beam balance**



- **Electronic balance**



- **Exact mass:** The correct mass measured with a weighing scale that meets standards.
- **Non standard mass :** the mass that is not correct because the weighing scale used does not meet standards or the one who measured the quantity did it wrongly.
- **Weighing scale with standard measurements:** weighing scale that satisfies the guidelines for the production of uniform, interchangeable components, especially for use in mass production.

35. Unit 7 key vocabulary or concepts

- Liquid:** A mater that can be poured.
- A half litre:** When a litre is divided in 2 equal quantities, a half litre is equal to one quantity of them.
- A quarter litre:** When a litre is divided in 4 equal quantities, a quarter litre is equal to one quantity of them.

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