

MATHEMATICS

PRIMARY THREE

(P3)

TEACHER'S GUIDE

EXPERIMENTAL VERSION

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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 work 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 whole 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

ACKNOWLEDGEMENT

I wish to sincerely express my special appreciation to the people who played a major role in the translation and the adaptation of this teacher's guide for P3 Mathematics.

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My thanks first go to the Rwanda Basic Education Board staffs and teachers who were involved in the adaptation and the translation of this book from Kinyarwanda to English.

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Joan MURUNGI,

Head of CTRLR Department

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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 vocabularies:** 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 education needs in 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 learning 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 whole 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
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.	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.
Financial Education: The integration of Financial Education into	Through different examples and calculations on

<p>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>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 whole 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 organize classroom and limiting 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 understand 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 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 facilitate them in their learning. These activities can also be given to assist deepening knowledge acquired through the learning activities for slow pupils.
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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:

- **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.

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.- 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.	<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;- 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.

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 whole 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 (+, −, x, :) 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 examples 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 tangential theme related to the concept you want to discuss. Use graphics, images and multimedia materials and write keywords on the chalk board.

Ne 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. 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 learning strategies in CLIL

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.

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

When leaning is done in the second language, the teacher will facilitate the above mentioned learning strategies in the following ways:

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 involving objects or animals frequently seen by the child in the family.

- **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 requested, 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 facilitate problem solving. Learners are facilitated to work in groups where they can feel free to discuss and explain to each other in the simple language.

- **Mediation:** Asking questions for clarification. Learners are given opportunity to feel free to ask questions any time for they need more clarification.

PART II: SAMPLE LESSON

School Name: Primary School

Teacher's name: ...

Term	Date	Subject	Class	Unit N ^o	Lesson N ^o	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 whole 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
	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.		
	Teacher's activities	Learners activities	
Introduction or Review (5 minutes)	Provide simple questions on reading and writing numbers not less than 1000.	Observe and read umbers 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. 	<ul style="list-style-type: none"> - Cooperation developed through working together in group. Communication developed through reading numbers and the presentation of their findings. Peace and value addressed when all learners share ideas in a peaceful way with respect of others views. 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>Engagement and</p> <p>Presentation of findings</p>	<p>Activity 2:</p> <ul style="list-style-type: none"> - Form groups of learners and give them instructions on the activity; - Provide to each group number cards with numbers between 1000 and 2000; - Ask each group to complete their numbers in a table of 	<p>Activity 2:</p> <ul style="list-style-type: none"> - Join groups as requested, Listen to instructions and ask question where necessary; - Take learning materials, draw the table of values; - Read the their numbers and complete them in a table of place values; 	<ul style="list-style-type: none"> Inclusive education addressed in classroom by encouraging all

	<p>place values;</p> <ul style="list-style-type: none"> - Monitor how learners are implementing instructions and how they are working in their groups; - Ask each group to present their findings to the whole 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"> - be sure that each member is able to present their work;. - Present the work to the whole class; - Provide comment on presentation where necessary. 	<p>learners to be engaged on the work and discussion.</p>
Application	<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; - Provide more exercises to gifted learners; - Mark the work for learners 	<p>Activity 3:</p> <p>Work out the activity and show the work to the teacher for feedback.</p>	

<p>Synthesis and summary</p>	<ul style="list-style-type: none"> - Invite learners to summarize new elements or concept they learnt; Help them to conclude appropriately; - 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: reading and writing a number which not greater than 2000; complete such a number in a table of values, writing the number in words. - Answer confidently to questions; - Copy the homework and be ready to do it. 	
<p>Observation</p>	<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>		

PART III: UNIT DEVELOPMENT

UNIT 1: WHOLE NUMBERS FROM 0 UP TO 2000

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 generic competences to be developed

Cooperation: developed when pupils work collaboratively in group to develop interpersonal relations and life skills;

Communication: developed when pupils discuss either in groups or in the whole class, present findings, debate etc.

Creativity and innovation: developed when pupils make number cards, apply skills in solving real life problems, etc.

Problem solving: when pupils use acquired skills to solve problems from their real life situation.

Lifelong learning: when the learner is engaged in activities showing her/him to have the need for more learning with a curiosity of applying the knowledge learnt in a range of situations.

1.5 Guidance on introductory activity 1

- Invite pupils to read the story of Mugarura who does not know the quantity of cabbages produced in his field and the number of the quantity harvested.
- Guide pupils to discuss the reason why that cultivator does not know the number of cabbages;

- Ask them to suggest what is required for every one of them to be able to count the quantity of harvest;
- 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 facilitate 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.

1.6 Guidance on how to help learners with special education needs

- Provide simple activities to slow learners found in this book
- Identify the level of physical impairment for some learners and facilitate them with appropriate learning resources;
- Identify talented pupils and give them more complex activities to retain them in learning without disturbing other classmates.

1.7. Sub-headings /list of lessons

UNIT 1: WHOLE NUMBERS FROM 0 UP TO 2000			40 periods
	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 from 0 to 2 000 in figures	Read in figures the numbers from 0 to 2000.	1
3	Writing numbers from 0 to 2 000 in figures	Write in figures the numbers from 0 to 2000.	1
4	Reading numbers from 0 to 2 000 in words	Read numbers from 0 to 2 000 in words.	1
5	Writing numbers from 0 to 2 000 in words	Write numbers from 0 to 2 000 in words.	1
6	Partition a number between 0 and 2 000 into ones, tens, hundreds and thousands	Expand a number between 0 and 2 000 into ones, tens, hundreds and thousands	1

7	Comparing numbers less than or equal to	Compare numbers less than or equal to 2000.	2
8	Arranging numbers less than or equal to 2 000 in ascending order	Arrange numbers less than or equal to 2 000 in ascending order.	1
9	Arranging numbers less than or equal to 2 000 in descending order	Arrange numbers less than or equal to 2 000 in descending order.	1
10	Addition of numbers whose sum does not exceed 2000 without carrying.	Add numbers whose sum does not exceed 2000 without carrying.	2
11	Addition of numbers whose sum does not exceed 2000 with carrying.	Add numbers whose sum does not exceed 2000 with carrying.	2
12	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.	2
13	Subtraction of numbers within 2000 without borrowing	Subtract numbers within 2000 without borrowing.	2
14	Subtraction of numbers within 2 000 with borrowing	Subtract numbers within 2000 with borrowing.	2
15	Word problems involving subtraction of numbers within 2 000	Solve word problems involving subtraction of numbers within 2 000.	2
16	Multiples of 7 not exceeding 70	Give multiples of 7 that do not exceed 70.	1
17	Multiples of 8 not exceeding 80	Give multiples of 8 that do not exceed 80.	1
18	Multiples of 9 not exceeding 90	Give multiples of 9 that do not exceed 90.	1
19	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 2 000.	2
20	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
21	Multiplication of a 2 or 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 2 000.	2
22	Word problems involving multiplication of a 3 digit number by a single digit number	Solve word problems involving multiplication of a 3 digit number by a single digit number where the product	2

	where the product does not exceed 2 000	does not exceed 2 000.	
23	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.	2
24	Word problems involving the division of a number less than 2000 by a one-digit number.	Solve word problems involving the division of a number less than 2000 by a one-digit number.	2
25	Word problems involving addition and subtraction	Solve word problems involving addition and subtraction.	1
26	Word problems involving multiplication and division	Solve word problems involving multiplication and division.	1
	End unit assessment	Count, read, write, order, compare, add, multiply and divide numbers from 0 to 2000.	2

1.8 Guidance on different lessons

1.8.1 Lesson 1: Reading and writing numbers from 0 to 2 000

a) Objectives

Knowledge:

Use correct language when reading whole numbers from 0 to 2000 in figures and in words

Skills:

Read and write correctly whole numbers less than 2000.

Values

Develop the spirit of orderliness in daily activities.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:
 - Work out different activities for reading and writing numbers less than 1000 given from the pupil's book for P2;
 - Draw the table of place value and complete in it numbers less than 1000 read from the number cards.

c) 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.

d) Teaching and learning activities:

- Show number cards of (or write on the chalk board) numbers between 1000 and 2000 and use different probing questions to guide pupils too discover how to read them (**see activity1**).
- Provide to pupils number cards with different numbers between 1000 and 2000 and ask each one to try to read and write numbers in words in the notebook. (**see Activity 2**).
- Form groups of pupils and give them digit cards with 0, 1 , 3, 4, 5, 6, 7, 8;
- Ask each group to use digit numbers to form a 4 digit number between 1000 and 2000 and ask them to read number made and write it in words; (**see Pair assessment**)
- Move around in the class for facilitating pupils and where necessary and give more clarifications reminding them to fix the first card with the number 1.
- Put number cards with numbers between 1000 and 2000 in a basket and ask each pupil to pick randomly one card, read its number and write it in words. (**see self assessment**).

e) 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 read and write that number.

f) 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.

g) Answer for activities

Activity 1.1.1: Guide pupils to read numbers correctly.

Answer for Activity 1.1.2:

Pupils can form different numbers the following are examples:

- 1) 1 022, 1 023, 1 024, 1 025, 1 026, 1 027, 1 028, 1 029
- 2) 1 042, 1 043, 1 044, 1 045, 1 046, 1 047, 1 048, 1 049
- 3) 1 062, 1 063, 1 064, 1 065, 1 066, 1 067, 1 068
- 4) 1 082, 1 083, 1 084, 1 085, 1 086, 1 087, 1 088, 1 089

Answer for Self assessment 1.1

Pupils can form different numbers the following are examples

- a) 1 234, 1 243, 1 324, 1 342, 1 423, 1 432

b) 1 567, 1 576, 1 657, 1 675, 1 756, 1 765

c) 1 089, 1 098, 1 809, 1 890, 1 908, 1 980

Answer for Pair assessment 1.1

Guide each Pupil read the number on the card picked to his/her colleague.

Answer for Activity 1.2

Rule to follow when writing number in words:

When you write a whole number, you write out the number in words as well as in digits. To write a number in words, write the number in each period followed by the name of the period without the 's' at the end. Start with the digit at the left, which has the largest place value. The commas separate the periods, so wherever there is a comma in the number, write a comma between the words. The ones period, which has the smallest place value, is not named.

Example: 519 248= 519,248



Then, 519,248 is five hundred nineteen thousand, two hundred forty-eight.

Notice that the word *and* is not used when naming a whole number.

The following are examples of numbers which can be formed:

1) **1 974:** One thousand, nine hundred seventy four;

1 947: One thousand, nine hundred forty seven;

1 794: One thousand, seven hundred ninety four

2) **1 687:** One thousand, six hundred eighty seven.

1 678: One thousand, six hundred seventy eight

1 876: one thousand, eight hundred seventy six.

3) **1 892:** One thousand, eight hundred ninety two.

1 829: One thousand, eight hundred twenty nine.

1 928: One thousand, nine hundred twenty eight.

4) **1 957**: One thousand, nine hundred fifty seven.

1 975: One thousand, nine hundred seventy five.

1 597: One thousand, five hundred ninety seven.

Answer for application activity 1.1

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) 150: One hundred fifty; 500: Five hundred; 800: eight hundred; 1 100: One thousand, one hundred; 1 400: One thousand, 4 hundred.

Answer for Self assessment 1.2

Guide pupils to be able to read and write the numbers in figure and in words:

a) Whole 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) Whole 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;

c) Whole numbers between 1 590 and 1 600 are the following:

1 591; 1 592; 1 593; 1 594; 1 595; 1 596; 1 597; 1 598; 1 599;

d) Whole numbers between 1 920 and 1 930 are the following:

1 921; 1 922; 1 923; 1 924; 1 925; 1 926; 1 927; 1 928 and 1 929.

Answer for Pair assessment 1.2

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 at least 10 numbers which are between 1 000 and 2 000.

Example: 1 739, 1 793, 1 379...

Answer for Application activity 1.2

1) a) One thousand, nine hundred twenty four.

b) 1 319

c) 1 874

d) One thousand, four hundred ninety nine.

2) Verify if numbers made by pupils are between 1 000 and 2 000. Guide them to be able to read and write those numbers in figures and in words.

Examples:

1 589: One thousand, five hundred eighty nine;

1 598: One thousand, five hundred ninety eight.

1 859: One thousand, eight hundred fifty nine.

1 895: One thousand, eight hundred ninety five.

1 958: One thousand, nine hundred fifty eight.

1 985: One thousand, nine hundred eighty five

3) Numbers in the table

A 1 674: **One thousand, six hundred seventy four**

B One thousand, nine hundred five : **1 905**

C 1395: **One thousand, three hundred ninety five**

d Two thousand: **2000**

e 1719: **One thousand, seven hundred nineteen.**

f One thousand, three hundred, forty seven: **1 347**

1.8.2 Lesson 2: Partition a number between 0 and 2 000 into ones, tens, hundreds and thousands

a) Objectives

Knowledge:

Understand and identify the place value of numbers formed by four digits

Skills:

Partition a four digit number not less than 2000 into thousands (T), Hundreds(H), Tens(T) and Ones (O)

Values

Develop the capacity of quick critical thinking

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:

- Work out different activities for partitioning **number between 0 and 1 000 into ones, tens, hundreds and thousands** given from the pupil's book for P2;

- Draw the table of place value and complete in it numbers less than 1000 read from the number cards.

c) 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.

d) 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 numbers cards 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 and where necessary;
- Invite some groups to present their findings and then help them to harmonize;
- Assign each pupil to Write down the number that was partitioned into thousands (Th), hundreds (H), tens (T) and ones (O) (see **self assessment 1.3**).
- Assign the same groups to do activity 1.3.3 and 1.3.4 and move around to each group to verify their performance.

e) 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).

f) Assessment

- Provide application activities to be done by pupils (see application activity 1.3) and check their answers ;
- Assign all pupils to do the Application activity 1.3.2 as homework.

g) Answer for activities

Answers for activity 1.3.1:

1 456: 2Thousands, 4Hundreds,5 Tens and 6 ones.

Answers for 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 1.3.1.

Answer for the self assessment 1.3

a) 1 795 b) 1 999 c) 1 649 d) 1 395 e) 1 957 f) 1 295.

Answer for application activity 1.3.1

- a. 456 = 0Thousand, 4Hunderds,5Tens 6Ones.
- b. 1996= 9Tens, 1Thousand, 6Ones, 9Hundreds.
- c. 1759 = 7Hundreds, 9Ones, 1Thousands, 5 Tens.
- d. 1239 = 9Ones,2Hundreds, 3Tens, 1Thousands.
- e. 1197 = 9Tens, 1hundreds, 1Thousands, 7Ones.
- f. 1597 = 5 hundreds, 7Ones, 1Thousands, 9 Tens.

Answers for activity 1.3.3

- a) 1 675= 1 thousands 6hundreds 7Tens 5O ones.
 - b) 1 874 =1000+800+70+4
- Then 1 874 =1 thousands 8hundreds 7tens 4 ones

Answers for activity 1.3.4

a) 1 265 = 1 thousands 2 hundreds 6 tens 5 ones	c) 1 645 = 1 thousands 6 hundreds 4 tens 5 ones	e) 1 997 = 1 thousands 9 hundreds 9 tens 7 ones
b) 1 799 = 1 thousands 7hundreds 9tens 9 ones	d) 1 436 = 1 thousands 4 hundreds 3 tens 6 ones	f) 1 956 = 1 thousands 9 hundreds 5tens 6 ones.

Answers for Pair assessment 1.3

- a) $(1 \times 1\,000) + (9 \times 100) + (4 \times 10) + (5 \times 1) = 1945$
- b) $1\,000 + 900 + 50 + 9$ equals to 1959
- c) 1 thousands + 9 hundreds + 7 tens + 3 equals to 1973.

Answer for application activity 1.3.1

1) The place and the value of the underlined digit:

- a) 6 stands for Ones b) 9 stands for Tens c) 3 stands for Hundreds d) 9 stands for tens
e) 1 stands for thousands and f) 7 stands for tens.

2) a) 1 996 b) 1 997 c) 1 799 d) 1 584

3) Place values

- a) 1 765 = 1 Thousands 7 Hundreds 6 Tens 5 Ones
b) 1 672 = 1 Thousands 6 Hundreds 7 Tens 2 Ones
c) 1 956 = 1 Thousands 9 Hundreds 6 Tens 6 Ones
d) 1 254 = 1 Thousands 2 Hundreds 5 Tens 4 Ones
e) 1 564 = 1 Thousands 5 Hundreds 6 Tens 4 Ones

4) The number that was expanded into thousands (th), hundreds (H), tens (T) and ones (O).

a) $(1 \times 1\,000) + (2 \times 100) + (3 \times 10) + (4 \times 1) = 1\,234$

b) $1\,000 + 300 + 70 + 1 = 1\,371$

c) $1\text{thousands} + 7\text{hundreds} + 9\text{tens} + 6\text{ones} = 1\,796$

1.8.3 Lesson 3: Comparing numbers less than or equal to 2000

a) Objectives

Knowledge:

Understand how to compare numbers less than or equal to 2000.

Skills:

Compare and order numbers less than or equal to 2000.

Values

Develop the capacity of quick critical thinking to compare quantities of things.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:

- Work out different activities for comparing **number between 0 and 1 000** given from the pupil's book for P2;

- Read numbers less than 1000 from the number cards, draw the table of place value and complete numbers in it.

c) 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.

d) 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 in the **activity 1.4.1**;

- Form groups of pupils and assign them to refer to the example of activity 1.4.1 and do activity 1.4.2;
- Move around in the class for facilitating pupils where necessary; assign to those who finish to discuss and how to do the activity 1.4.3;
- Invite some groups to present their findings and then help them to harmonize;
- Assign the same groups to do activity 1.4.4 and 1.4.5 and move around to each group to verify their performance.

e) 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).

f) Assessment

- Provide application activities to be done by pupils (use the application activity 1.4) and check their answers;
- Assign all pupils to do the self assessment 1.4 as homework.

g) Answer for activities

Answers for activity 1.4.1:

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

Answers for activity 1.4.2:

- 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) $1\ 670 = 1\ 670$

Answers for activity 1.4.3:

- a) $1\ 329 < 1\ 408$ b) $1\ 736 > 1\ 763$ c) $1\ 429 = 1\ 249$
 d) $1\ 709 = 1\ 709$ e) $1\ 206 < 1\ 216$ f) $1\ 670 < 1\ 671$

Answers for activity 1.4.4:

- a) $1\ 311 < 1\ 515$ b) $1\ 180 < 1\ 798$ c) $1\ 140 < 1\ 834$ d) $1\ 084 = 1\ 084$

Answers for self assessment 1.4

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

Answers for activity 1.4.5:

- a) Muhizi has 799 votes
 b) Mutesi has 1 259 votes
 c) Kayitesi has 1005 votes

- d) Mutayomba has 1 234 votes
 e) Among the candidates, Muhizi has few votes (799)
 f) Among the candidates, Mutesi has many votes (1259).
 g) Comparing votes

- $1\ 005 < 1\ 234$ • $1\ 005 < 1259$ • $1\ 234 < 1\ 259$
 • $1\ 005 > 799$ • $1\ 234 > 799$ • $799 < 1\ 259$

Answers for application activity 1.4

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

1.8.4 Lesson 4: Arrange numbers between 0 and 2000

a) Objectives

Knowledge:

Understand the meaning of more things that do not exceed 2000 and few things

Skills:

Arrange numbers less than or equal to 2000 in a given order

Values

Develop the capacity of ordering objects depending on their quantities.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:
 - Work out different activities for arranging numbers **between 0 and 1 000 in an ascending or descending order** given from the pupil's book for P2;
 - Read numbers less than 1000 from the number cards, complete them in the table of place values and order them in a given order.

c) 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.

d) Teaching and learning activities:

- Form groups of pupils and assign them to do the **activity 1.5.1** where they have to: draw a table of place values, complete numbers in the table, compare these numbers and arrange them from the smallest to the largest number.
- 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 order numbers from the smallest to the largest (in ascending order).
- Assign the same groups to do **activity 1.5.2** 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 largest (in descending order).

e) 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 facilitate the comparison and then the arrangement of numbers.

f) Assessment

- Assign pupils to work in pair, work out pair assessment 1.51 and 1.5.2 and verify their answers
- Provide application activities to be done by pupils (self assessment 1.51 and 1.5.2) and check their answers;
- Assign homework to all pupils.

g) Answer for activities

Answers for activity 1.5.1

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

Answers for self assessment 1.5.1

Pupils will use different numbers, as a teacher you have to verify if such numbers are well arranged.

Answers for Pair assessment 1.51

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

Answers for activity 1.5.2

In descending order

- a) 1 840, 1 084, 1 048. b) 1 632, 1 326, 1 236.

Answers for self assessment 1.5.2

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

1.8.5 Lesson 5: Addition of numbers whose sum does not exceed 2000

a) Objectives

Knowledge:

Understanding the addition of numbers whose sum does not exceed 2000 with or without carrying

Skills:

Addition of numbers whose sum does not exceed 2000 with and without carrying.

Values

Having self confidence in performing the sum of objects.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:
 - Work out different activities for adding numbers whose sum does not exceed **1 000** given from the pupil's book for P2;
 - Read small numbers from the number cards, complete them in the table of place values and add them.

c) 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.

d) Teaching and learning activities:

- Form groups of pupils and assign them to do the **activity 1.6.1** 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 1.6.2** and move around to each group to verify their performance;
- Ask some groups to present answers and then guide the whole class to harmonize by explaining how to add numbers *with carrying*.

e) Synthesis/summarization

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

f) Assessment

- Assign pupils to work in pair, work out pair assessment 1.6.1 and 1.6.2 and verify their answers
- Provide application activities to be done by pupils (self assessment 1.6.1 and 1.6.2) and check their answers;
- Assign homework to all pupils.

g) Answer for activities

Answers for activity 1.6.1

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

Answers for pair assessment 1.6.1

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

Answers for self assessment 1.6.1

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

Answers for Application activity 1.6.1

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

Answers for activity 1.6.2

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

Answers for pair assessment 1.6.2

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

Answers for self assessment 1.6.2

a) 1 955 c) 1 992 e) 1 654
b) 1 994 d) 1 941 f) 1 715

Answers for Application activity 1.6.2

a) 1 851 c) 1 894 e) 1 654
b) 1 472 d) 1 920 f) 1 933

Note:

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 (givens and requests), draw visual representations and solve the problem using the addition*.

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

Answers for pair assessment 1.7

- 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: $799 + 356 + 795 = 1\,950$

Answers for self assessment 1.7

- 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: $675 + 199 + 992 = 1\ 866$

1.8.6 Lesson 6: Subtraction of numbers within the range of 2000

a) Objectives

Knowledge:

Understanding the subtraction of numbers less than 2000 with or without borrowing.

Skills:

Subtract a number from another without or with borrowing;

Values

Having self confidence in performing the difference two numbers.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:
 - Work out different activities for finding the difference of numbers less than 1 000 given from the pupil's book for P2;
 - Read numbers from two number cards, complete them in the table of place values and perform the subtraction to find the difference.

c) 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.

d) Teaching and learning activities:

- Form groups of pupils and assign them to do the **activity 1.8.1** and **activity 1.8.2** 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 1.8.3** and move around to each group to verify their performance;

- Ask some groups to present answers and then guide the whole class to harmonize by explaining how to subtract a number from another *without borrowing*.

e) 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.

f) Assessment

- Assign pupils to work in pair, work out pair assessment 1.8.1 and verify their answers.
- Provide application activities to be done by pupils (self assessment 1.8.1) and check their answers;

Note:

The lesson on the **subtraction of numbers with borrowing** is taught in the same way but at this level:

Use the example given in the activity 1.8.3 and guide pupils to **insist on how to borrow and the motive of doing it**. Provide the instruction on the pair assessment 1.8.2 before giving the self assessment 1.8.2 and the application activity 1.8.2.

g) Answer for activities

Answers for activity 1.8.1

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

Answers for activity 1.8.2

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

Answers for pair assessment 1.8.1

- $1\ 698 - 1\ 426 = 282$
- $1\ 875 - 1\ 352 = 523$
- $1\ 579 - 1\ 156 = 423$
- $1\ 385 - 1\ 274 = 111$
- $1\ 296 - 276 = 1\ 020$
- $1\ 473 - 1\ 062 = 412$
- $1\ 958 - 1\ 327 = 631$

Answers for self assessment 1.8.1

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

Answers for application activity 1.8.1

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

Answers for activity 1.8.3

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

Answers for pair assessment 1.8.2

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

Answers for self assessment 1.8.2

a) 235 b) 144 c) 38 d) 348 e) 157 f) 553

Answers for application activity 1.8.2

a) 168 b) 480 c) 800 d) 40 e) 255.

Note:

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 (givens and requests), draw visual representations and solve the problem using the subtraction.*

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

Answers for pair assessment 1.9

- 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 men and youth living in our sector: $1\ 163 - 9\ 99 = 164$
- 4) The number of the remaining sacks: $1\ 721 - 179 = 1\ 542$

Answers for Self assessment 1.9

- 1) Number of remaining trees: $2\ 000 - 1\ 099 = 901$
- 2) Number of patients who are not yet getting well: $1\ 532 - 799 = 733$
- 3) The number of the remaining bricks: $1\ 911 - 975 = 936$
- 4) The number of students who study at the school: $1\ 921 - 124 = 1797$.

Answers for application activity 1.9

- 1) a) $1\ 234 + 396 = 1\ 630$ d) $1\ 623 + 245 = 1\ 868$
b) $1\ 234 + 695 = 1\ 929$ e) $1\ 623 + 309 = 1\ 932$
c) $1\ 234 + 319 = 1\ 553$ f) $1\ 623 + 299 = 1\ 922$
- 2) a) $1\ 234 - 396 = 838$ d) $1\ 623 - 245 = 1\ 378$
b) $1\ 234 - 695 = 539$ e) $1\ 623 - 309 = 1\ 314$
c) $1\ 234 - 319 = 915$ f) $1\ 623 - 299 = 1\ 324$
- 2) People who are allowed to vote in the cells: $996 + 999 = 1\ 995$.
- 4) The number of adults who were registered in our cell is: $1\ 964 - 1\ 324 = 640$

1.8.7 Lesson 7: Multiplication of numbers whose product does not exceed 2000

A) Multiplication by 7 and multiples of 7 not exceeding 70

a) Objectives

Knowledge:

Understanding the multiplication by 7

Skills:

Multiplying numbers by 7 and establishing a multiplication table of 7.

Values

Having self confidence in performing the product of numbers.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to work out different activities for finding the multiples of a number less than 7 not exceeding 60.

c) Teaching resources and learning resources

- At least 70 Counters per group;
- Exercise books

d) Teaching and learning activities:

- Form groups of pupils and assign them to do the **activity 1.10.1 2** 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;
- 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 application **activity activity1.10** and move around to each group to verify their performance;
- Ask some groups to present answers and then guide the whole class to harmonize by explaining how to multiply by 7.

e) Synthesis/summarization

- Guide pupils to find multiples of 7.

f) Assessment

- Provide application activities to be done by pupils and check their answers;

Note: The lesson related to: Multiplication by 8 and multiples of 8 not exceeding 80 (**activity 1.11.1**), Multiplication by 9 and multiples of 9 not exceeding 90 (**activity 1.12**) are taught in the same way as this previous lesson.

g) Answer for activities

Answer for activity 1.10.1

Answers will differ; verify the answer provided by each pupil.

Answer for application activity 1.10

- 1) a) $7 = 7 \times 1$ d) $28 = 7 \times 4$ g) $49 = 7 \times 7$ j) $70 = 7 \times 10$
b) $14 = 7 \times 2$ e) $35 = 7 \times 5$ h) $56 = 7 \times 8$
c) $21 = 7 \times 3$ f) $42 = 7 \times 6$ i) $63 = 7 \times 9$

- 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.

B) Multiply a two-digit or three-digit number by 7, 8 and 9 where the product does not exceed 2000

a) Objectives

Knowledge:

Understanding the multiplication of a 3 digit number by **7, 8 and 9** where the product does not exceed **2000**

Skills:

Multiply a 3 digit number by **7, 8 and 9**

Values

Having self confidence in performing the product of numbers.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:
 - Work out different activities for multiplying a 2 digit number by 5, or 6.

c) Teaching resources and learning resources

- The table of place values;
- Different types of counters.

d) Teaching and learning activities:

- Form groups of pupils and assign them to do the **activity 1.13** 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 pair assessment 1.13 and move around to each group to verify their performance;
- Ask some groups to present answers and then guide the whole class to harmonize by explaining how to do it.

e) 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.

f) Assessment

- Provide application activities to be done by pupils (self assessment 1.13 and the application activity 1.13) and check their answers;
- Assign homework to all pupils.

g) Answer for activities

Answer for activity 1.13

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

Answer for pair assessment 1.13

- a) 1 715 b) 1 720 c) 1 800 d) 1 673 e) 1 512

Answer for self assessment 1.13

- 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) $(200 \times 9) + (0 \times 9) + (9 \times 9) = 1881$

Answer for application activity 1.13

- a) 1 370 b) 1 836 c) 1 408 d) 1 791 e) 774

C) Multiply a two-digit or three-digit number by a two digit number where the product does not exceed 2000

a) Objectives

Knowledge:

Understanding the meaning of multiplication of a 3 digit number by a two digit number **where the product does not exceed 2000**

Skills:

Multiply a 3 digit number by a two digit number

Values

Having self confidence in performing the product of numbers.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:
 - Work out different activities for multiplying a 2 digit number by a single digit.

c) Teaching resources and learning resources

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

d) Teaching and learning activities:

- Form groups of pupils and assign them to do the **activity 1.14** 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 pair assessment 1.14 and move around to each group to verify their performance;
- Ask some groups to present answers and then guide the whole class to harmonize by explaining how to do it.

e) 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.

f) Assessment

- Provide application activities to be done by pupils (self assessment 1.14 and the application activity 1.14) and check their answers;
- Assign homework to all pupils.

g) Answer for activities

Answer for activity 1.14

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

Answer for pair assessment 1.14

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

Answer for application activity 1.14

- a) $116 \times 16 = 1\,856$ c) $116 \times 17 = 1\,972$ e) $116 \times 13 = 1\,508$
b) $116 \times 15 = 1\,740$ d) $116 \times 14 = 1\,624$ f) $116 \times 12 = 1\,392$

Answers for Pair assessment 1.15

- 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 = $165 \times 12 = 1\,980$

Answers for self assessment 1.15

- 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 = $18 \times 15 = 270$

Note:

Refer to activity 1.16, and the application activity 1.16 to teach a lesson showing learners how to multiply by 100 and 1000 where the product does not exceed 2000.

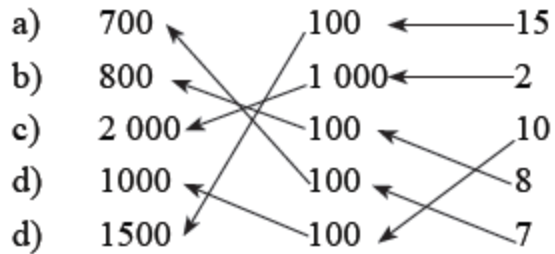
Answer for activity 1.16

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

Answer for application activity 1.16

- a) 100 d) 10 g) 1 000 j) 100
b) 100 e) 1 000 h) 1 000
c) 100 f) 10 i) 10

Answers for self assessment 1.16



1.8.8 Lesson 8: Division without a remainder of a 4-digit number less than 2000 by a 1-digit number

a) Objectives

Knowledge:

Understanding the meaning of division of a number by another

Skills:

Divide correctly a 4 digit number by one digit number.

Values

Having self confidence in performing the division of numbers.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to work out different activities for dividing a 2 digit number by a single digit number.

c) Teaching resources and learning resources

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

d) Teaching and learning activities:

- Form groups of pupils and assign them to do the **activity 1.17.1** and 17.2 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 pair assessment 1.17 and move around to each group to verify their performance;

- Ask some groups to present answers and then guide the whole class to harmonize by explaining how to do it.

e) Synthesis/summarization

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

f) Assessment

- Provide application activities to be done by pupils (the application activity 1.17) and check their answers;

- Assign homework to all pupils.

g) Answer for activities

Answer for activity 1.17.1

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

Answer for activity 1.17.2

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

Answers for pair assessment 1.17

- $1\ 443 : 3 = 481$
- $1\ 875 : 5 = 375$
- $1\ 648 : 8 = 206$
- $1\ 796 : 4 = 449$
- $1\ 542 : 6 = 257$
- $1\ 899 : 9 = 211$
- $1\ 687 : 7 = 241$

Answers for application activity 1.17

1) a) $1\ 064 : 8 = 133$ c) $2\ 000 : 5 = 400$ f) $1\ 872 : 8 = 234$
b) $1\ 998 : 9 = 222$ d) $1\ 872 : 6 = 312$ e) $1\ 267 : 7 = 181$

Note:

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 (givens and requests), draw visual representations related to equal shares and solve the problem using the division.*

Start by guiding pupils to solve some problems in a whole class discussion, provide problems to be solved into groups or in pairs and then give problems to be solved individually. Refer to activity 1.18, pair assessment 1.18 and self assessment 1.18.

Answers for pair assessment 1.18

- 1) Number of students for each classroom= $378 : 9 = 42$
- 2) Number of books each school can receive = $894 : 6 = 149$

- 3) Number of mosquito nets each cell can receive = $1\ 985 : 5 = 397$
 4) Number of sacks of irish potatoes to be carried by each lorry = $1\ 359 : 9 = 151$

Answers for self assessment 1.18

- 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 = $1\ 845 : 5 = 369$

1.9 Summary of the unit

Try to summarize the content for this unit.

1.10 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.

Unit key vocabularies or concepts

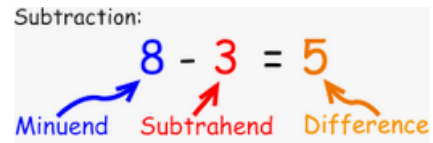
- **Ones (O)**: In a whole number, Ones is a place value of a digit showing the number of unities.
- **Tens (T)**: it is the place value of a digit for a whole number that shows the number of tens it stands for.
- **Hundreds (H)**: it is the place value of a digit for a whole number that shows the number of hundreds it stands for.
- **Thousands (T)**: it is the place value of a digit for a whole number that shows the number of thousands it stands for.
- **Partion** or 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 largest or starting by the largest to the smallest
- Sum: the answer obtained when you add numbers.

Addition:

$$8 + 3 = 11$$

Diagram illustrating the addition of 8 and 3 to get 11. The number 8 is labeled "Addend" with a blue arrow pointing to it. The number 3 is labeled "Addend" with a red arrow pointing to it. The result 11 is labeled "Sum or Total" with an orange arrow pointing to it.

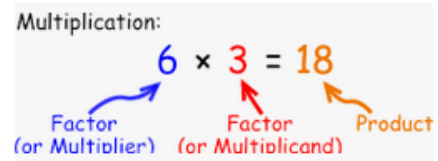
- Difference: The answer obtained when you subtract a number from another.



- Product: The answer you obtain when you multiply numbers;

- Multiplicand: It is the number to be multiplied to find a product of two numbers.

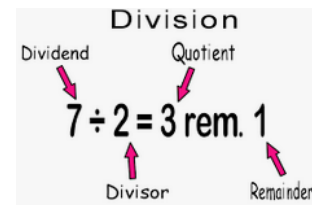
- Multiplier: it is a number that multiplies the multiplicand to find a product of two numbers



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



1.11 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) a) 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 = $1\ 998 : 6 = 333$

1.12 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) $450 \dots 1\ 000$ b) $850 \dots 850$ c) $1\ 240 \dots 1\ 500$

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 one 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 798children, 157men, 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: $1\ 872 : 9 = 208$

UNIT 2: WHOLE NUMBERS FROM 0 UP TO 5000

2.1 Key unit competence:

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

2.3 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 Generic competences to be developed

Cooperation: developed when pupils work collaboratively in group to develop interpersonal relations and life skills;

Communication: developed when pupils discuss either in groups or in the whole class, present findings, debate etc.

Creativity and innovation: developed when pupils make number cards, apply skills in solving real life problems, etc.

Problem solving: when pupils use acquired skills to solve problems from their real life situation.

Lifelong learning: when the learner is engaged in activities showing her/him to have the need for more learning with a curiosity of applying the knowledge learnt in a range of situations.

2.5 Guidance on 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 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 facilitate 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.

2.6 Guidance on how to help learners with special education needs

- Provide simple activities to slow learners found in this book
- Identify the level of physical impairment for some learners and facilitate them with appropriate learning resources;
- Identify talented pupils and give them more complex activities to retain them in learning without disturbing other classmates.

2.7 Sub-headings /List of lesson

UNIT 2: WHOLE NUMBERS FROM 0 UP TO 5000			40 Periods
	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 from 0 to 5 000 in figures	Read in figures the numbers from 0 to 5000.	1
3	Writing numbers from 0 to 5 000 in figures	Write in figures the numbers from 0 to 5000.	1
4	Reading numbers from 0 to 5 000 in words	Read numbers from 0 to 5 000 in words.	1
5	Writing numbers from 0 to 5 000 in words	Write numbers from 0 to 5 000 in words.	1
6	Partition of a number between 0 and 5000 into ones, tens, hundreds and	Expand a number between 0 and 5 000 into ones, tens, hundreds and thousands.	1

	thousands		
7	Comparing numbers less than or equal to 5 000	Compare numbers less than or equal to 5000.	2
8	Arranging numbers less than or equal to 5 000 in ascending order	Arrange numbers less than or equal to 5000 in ascending order.	2
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.	2
10	Addition of numbers whose sum does not exceed 5 000 without carrying	Add numbers whose sum does not exceed 5000 without carrying.	2
11	Addition of numbers whose sum does not exceed 5 000 with carrying	Add numbers whose sum does not exceed 5000 with carrying.	2
12	Word problems involving addition of numbers whose sum does not exceed 5 000	Solve word problems involving addition of numbers whose sum does not exceed 5000.	3
13	Subtraction of numbers within 5000 without borrowing	Subtract numbers within 5000 without borrowing.	2
14	Subtraction of numbers within 5 000 with borrowing	Subtract numbers within 5000 with borrowing.	3
15	Word problems involving subtraction of numbers within 5 000	Solve word problems involving subtraction of numbers within 5000.	2
16	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
17	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.	2
18	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
19	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
20	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
21	Word problems involving addition and subtraction	Solve word problems involving addition and subtraction.	1

22	Word problems involving multiplication and division	Solve Word problems involving multiplication and division.	1
	End unit assessment	Count, read, write, expand, decompose, order, compare, add, subtract, multiply, divide whole numbers less than or equal to 5000.	2

2.8 Teaching and learning activities

2.8.1 Lesson 1: Reading and writing numbers from 0 to 5 000

a) Objectives

Knowledge:

Use correct language when reading whole numbers from 0 to 5 000 in figures and in words

Skills:

Read and write correctly whole numbers less than 5 000.

Values

Develop the spirit of orderliness in daily activities.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:
 - Work out different activities for reading and writing numbers less than 2 000 given from the pupil's book for P2;
 - Draw the table of place value and complete in it numbers less than 2 000 read from the number cards.

c) 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.

d) Teaching and learning activities:

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

e) 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 read and write that number.

f) 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.

g) Answer for activities

Answer for activity 2.1.1: Guide pupils to read numbers correctly.

Answer for activity 2.1.2:

Pupils will read these numbers:

- a) 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.

Answer for self assessment 2.1

Pupils can form different numbers the following are examples

- a) 2345 ; 2 418 ; 2 165 d) 3580; 3 899; 3 765.
- b) 2 567; 2 689; 2 967 e) 4 376 ; 4 450, 4 499.
- c) 3 125 ; 3 459 ; 3 399 f) 4 789, 4 632 ; 4 895.

Answer for application activity 2.1

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

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

Answer for 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.

Answer for activity 2.2.2

- 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

Answer for activity 2.2.3

Example of numbers: 2 134; 2 135, 2 145; 2 154; 3 124; 3 125; 3 234; 3 245; 4 135; 4 235.

Answer for self assessment 2.2

Pupils will read and write them in figure and in words:

1) 2 016; 2 017; 2 018; 2 019.

2) 2 031; 2 032; 2 033; 2 034.

3) 2 071; 2 072; 2 073; 2 074.

4) 3 026; 3 027; 3 028; 3 029.

5) 4 066; 4 067; 4 068; 4 069.

Answers for application activity 2.2

- 1) a) Four thousand, nine hundred twenty four.
b) 3 018
c) 4 870
d) Two thousand, nine hundred forty nine.
e) Four thousand, one hundred fifty seven.
f) 2 754

2) Example:

Read and write them in word: 1 234; 2 134; 4 123; 3 421; 4 231; 2 341.

3)

a	Three thousand, seven hundred sixty four.	d	4 908	g	Two thousand, two hundred seventy three.
b	2 705	e	Four thousand, nine hundred thirty six.	h	3 539
c	Three thousand, nine hundred fifty three.	f	2 307	i	Four thousand seven hundred nineteen.

2.8.2 Lesson 2: Partition a number between 0 and 5 000 into ones, tens, hundreds and thousands

a) Objectives

Knowledge:

Understanding the place value of each digit in a four digit numbers

Skills:

Decomposing numbers less than or equal to 5000 into ones, tens, hundreds and thousands

Values

Develop the capacity of quick critical thinking

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:
 - Work out different activities for partitioning **number between 0 and 2 000 into ones, tens, hundreds and thousands;**
 - Draw the table of place value and complete in it numbers less than 2000 read from the number cards.

c) Teaching resources and learning resources

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

d) Teaching and learning activities:

This lesson is taught like the lesson 2 seen in unit 1 related to portioning of a number into ones, tens, hundreds and thousands.

e) 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).

f) Assessment

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

g) Answer for activities

Answers for activity 2.3.1:

Thousands	Hundreds	Tens	Ones
3	5	4	6

2	9	3	2
4	9	6	9
2	7	9	4
4	9	3	5

Guide pupils to be able to explain the decomposition for each number like in the answer of activity 1.3.1.

Answers for activity 2.3.2:

- a) 2564 = 2Thousands 5Hunderds 6Tens 4Ones.
- b) 3968 = 6Tens 3Thousands 8 Ones 3Hundreds.
- c) 4975= 9Hundreds 5Ones4Thousands 5 Tens.
- d) 2936 = 6Ones9 Hundreds 3Tens2Thousands.
- e) 3917 = 1Tens 9Hundreds 3Thousands 7Ones.
- f) 4795 = 7Hundreds 5Ones 4Thousands 9 Tens.

Answers for activity 2.3.2:

- a) 2 975 b) 4 819 c) 2 664
- d) 2 359 e) 3 597 f) 4 194

Answer for the self assessment 2.3

- 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) $4\ 645 = (4 \times 1\ 000) + (6 \times 100) + (4 \times 10) + (5 \times 1)$

Answer for the pair assessment 2.3

- a) 2 639 b) 4 379 c) 3 742

Answer for application activity 2.3

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

2	3	4	2
4	9	2	5
2	9	5	9
3	7	5	9

- 1) a) 4 ones c) 4Tens e) 1Tens
 b) 4thousands 5 tens d) 9hundreds f) 3thousands 9ones
- 2) a) 4 975 c) 2 796 e) 4 879
 b) 3 647 d) 3 528 f) 2 677
- 3) a) 2 694 b) 4 549 c) 3 475

2.8.3 Lesson 3: Comparing numbers less than or equal to 5 000

a) Objectives

Knowledge:

Understand how to compare numbers less than or equal to 5 000.

Skills:

Compare and order numbers less than or equal to 5 000.

Values

Develop the capacity of quick critical thinking to compare quantities of things.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:
 - Work out different activities for comparing **number between 0 and 2 000**.
 - Read numbers less than 2 000 from the number cards, draw the table of place value and complete numbers in it.

c) 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.

d) Teaching and learning activities:

This lesson is taught like the lesson 3 seen in unit 1. But numbers to be compared are between 2000 and 5 000 and you will refer to the activity 2.4.1

e) 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).

f) Assessment

- Provide application activities to be done by pupils (use the pair assessment 2.4 and the application activity 2.4) and check their answers;
- Assign all pupils to do the self assessment 2.4 as homework.

g) Answer for activities

Answers for self assessment 2.4

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 ($1\ 823 < 4\ 567$).

Answers for pair assessment 2.4

- 1) Ubumwe 2) Umutuzo 3) Amahoro 4) Amahoro
- 5) a) The number of men for Umutuzo is less than the number of men for Amahoro
- b) The number of men for Ubumwe is less than the number of men for Umubano
- c) The number of men for Amahoro is greater than the number of men for Umubano
- d) The number of men for Umutuzo is greater than the number of men for Ubumwe.

Answers for application activity 2.4

- a) $4\ 958 = 4\ 958$
- b) $3\ 174 > 2\ 797$
- c) $2\ 962 < 3\ 637$
- d) $4\ 253 > 2\ 352$
- e) $3\ 764 < 4\ 674$
- f) $2\ 315 < 4\ 135$

2.8.4 Lesson 4: 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

Knowledge:

Understand the meaning of more things that do not exceed 5 000 and few things.

Skills:

Arrange numbers less than or equal to 5 000 in a given order.

Values

Develop the capacity of ordering objects depending on their quantities.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:
 - Work out different activities for arranging numbers **between 0 and 2 000 in an ascending or descending order**;
 - Read numbers less than 2 000 from the number cards, complete them in the table of place values and order them in a given order.

c) 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.

d) Teaching and learning activities:

This lesson for arranging numbers between 2 000 and 5 000 in ascending or descending order is taught similarly with the lesson of arranging numbers between 0 and 1 000 learnt in the unit 1. Use the activity 2.5.1, activity 2.5.2, activity 2.5.3 and activity 2.5.4

e) 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 facilitate the comparison and then the arrangement of numbers.

f) Assessment

- Assign pupils to work in pair and work out pair assessment 2.5 and verify their answers.
- Provide application activities to be done by pupils (self assessment 2.5 and the application activity 2.5) and check their answers;
- Assign homework to all pupils.

g) Answer for activities**Answers for activity 2.5.1**

- 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

Answers for activity 2.5.2

- 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.

Answers for self assessment 2.5

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

Answers for activity 2.5.3

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

Answers for activity 2.5.4

- 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.

Answers for Pair assessment 2.5

- 1) a) 2 893, 2 938, 3 892. b) 2 834, 3 428, 4 328.
2) a) 4 693, 4 369, 3 496. b) 4 315, 4 153, 3 451.

Answers for application activity 2.5

- 1) a) 4 397, 4 739, 4 973 b) 3 479, 3 749, 4 97
2) a) 4 362, 3 263, 2 643 b) 4 763, 4 367, 3 647

2.8.5 Lesson 5: Addition of numbers whose sum does not exceed 5 000

a) Objectives

Knowledge:

Understanding the addition of numbers whose sum does not exceed 5 000 with or without carrying

Skills:

Addition of numbers whose sum does not exceed 5 000 with and without carrying.

Values

Having self confidence in performing the sum of objects.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:
 - Work out different activities for adding numbers whose sum does not exceed **2 000** learnt in the previous unit.
 - Read small numbers from the number cards, complete them in the table of place values and add them.

c) 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.

d) 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 2.6.1, activity 2.6.2 and the activity 2.7.

e) 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.

f) Assessment

- Assign pupils to work in pair, work out pair assessment 2.6.1 and 2.6.2 and verify their answers
- Provide application activities to be done by pupils (self assessment 2.6.1 and 2.6.2) and check their answers;
- Assign homework to all pupils.

g) Answer for activities

Answers for activity 2.6.1

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

Answers for self assessment 2.6.1

- 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) $4\,056 + 823 = 4\,879$

Answers for pair assessment 2.6.2

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	

Answers for Application activity 2.6.1

- 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) $3\,972 + 1\,017 = 4\,989$

Answers for activity 2.6.2

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

Answers for self assessment 2.6.2

a) $2\,943 + 1\,979 = 4\,922$ c) $1\,239 + 3\,678 = 4\,917$
b) $3\,967 + 797 = 4\,764$ d) $2\,795 + 2\,089 = 4\,884$

Answers for pair assessment 2.6.2

a) $1\,924 + 2\,789 = 4\,713$ d) $1\,952 + 2\,897 = 4\,849$ f) $3\,721 + 1\,089 = 4\,810$
b) $2\,905 + 1\,978 = 4\,883$ e) $2\,642 + 2\,198 = 4\,840$ g) $2\,313 + 2\,679 = 4\,992$
c) $3\,024 + 1\,879 = 4\,903$

Answers for Application activity 2.6.2

a) $4\,072 + 928 = 5\,000$ c) $3\,472 + 1\,097 = 4\,569$ e) $3\,246 + 1\,475 = 4\,721$
b) $3\,235 + 757 = 3\,992$ d) $3\,765 + 997 = 4\,762$

Note:

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 (givens and requests), draw visual representations and solve the problem using the addition*.

Start by guiding pupils to solve some problems in groups or in a whole class discussion (use activity 2.7), provide problems to be solved into groups or in pairs (**pair assessment 2.7**) and then give problems to be solved individually (**self assessment 2.7**).

Answers for pair assessment 2.7

- 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 self assessment 2.7

- 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: $3\,197 + 1\,789 = 4\,986$.

2.8.6 Subtraction of numbers within the range of 5 000

a) Objectives

Knowledge:

Understanding the subtraction of numbers less than 5 000 with or without borrowing.

Skills:

Subtract a number from another without or with borrowing.

Values

Having self confidence in performing the difference two numbers.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:
 - Work out different activities for finding the difference of numbers less than 2 000 learnt in the unit 1.
 - Read numbers from two number cards, complete them in the table of place values and perform the subtraction to find the difference.

c) 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.

d) 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 2.8.1, activity 2.8.2 and the activity 2.9 respectively.

e) 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.

f) Assessment

- Assign pupils to work in pair, work out pair assessment 2.8.1 or pair assessment 2.8.2 and verify their answers.
- Provide application activities to be done by pupils (self assessment 2.8.1 or self assessment 2.8.2) and check their answers.

g) Answer for activities

Answers for activity 2.8.1

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) $\begin{array}{r} 4\ 799 \\ -3\ 429 \\ \hline 1\ 370 \end{array}$
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Answers for self assessment 2.8.1

a) $4\ 795 - 2\ 563 = 2\ 232$	d) $4\ 965 - 3\ 941 = 1\ 024$
b) $3\ 765 - 2\ 431 = 1\ 334$	e) $2\ 765 - 1\ 312 = 1\ 453$
c) $2\ 897 - 1\ 794 = 1\ 103$	f) $3\ 956 - 2\ 932 = 1\ 024$

Answers for pair assessment 2.8.1

a) $4\ 967 - 3624 = 1343$	d) $4985 - 3712 = 1273$	g) $4738 - 2617 = 2121$
b) $3\ 857 - 2523 = 1334$	e) $3758 - 7715 = 1043$	f) $2896 - 1465 = 1431$
c) $2\ 957 - 3712 = 1042$		

Answers for application activity 2.8.1

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

Answers for activity 2.8.2

a) $\begin{array}{r} 4\ 243 \\ -2\ 798 \\ \hline 1445 \end{array}$	b) $\begin{array}{r} 3\ 613 \\ -2\ 379 \\ \hline 1\ 234 \end{array}$	c) $\begin{array}{r} 2\ 345 \\ -1\ 769 \\ \hline 576 \end{array}$	d) $\begin{array}{r} 3\ 524 \\ -2\ 659 \\ \hline 865 \end{array}$	e) $\begin{array}{r} 3\ 241 \\ -3\ 974 \\ \hline 267 \end{array}$
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Answers for self assessment 2.8.2

a) $4\ 571 - 3\ 796 = 775$	c) $4\ 234 - 3\ 596 = 638$	e) $4\ 567 - 2\ 789 = 1\ 778$
b) $3\ 423 - 2\ 975 = 448$	d) $2\ 345 - 1\ 687 = 658$	f) $3\ 567 - 1\ 678 = 1\ 889$

Answers for pair assessment 2.8.2

a) $4\ 123 - 2\ 079 = 2\ 044$	d) $2\ 346 - 1\ 879 = 467$	f) $5\ 000 - 4\ 976 = 24$
b) $3\ 105 - 1\ 987 = 1\ 118$	e) $4\ 241 - 3\ 786 = 455$	g) $4\ 000 - 3\ 298 = 702$
c) $4234 - 3978 = 256$		

Answers for application activity 2.8.2

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

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*

(givens and requests), draw visual representations and solve the problem using the subtraction.

Start by guiding pupils to solve some problems in groups or in a whole class discussion (use activity 2.9), provide problems to be solved into groups or in pairs (**pair assessment 2.9**) and then give problems to be solved individually (**self assessment 2.9**).

Answers for pair assessment 2.9

- 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 Self assessment 2.9

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

Answers for application activity 2.9

- | | |
|--|---|
| 1) a) $A\ 1 + C\ 1 = 4\ 254 + 659 = 4\ 913$ | d) $A\ 2 + D\ 2 = 3\ 672 + 1\ 279 = 4\ 951$ |
| b) $A\ 1 + D\ 1 = 4\ 254 + 591 = 4\ 845$ | e) $A\ 3 + C\ 4 = 2\ 675 + 1\ 99 = 2\ 874$ |
| c) $A\ 2 + C\ 2 = 3\ 672 + 1098 = 4\ 770$ | f) $A\ 3 + D\ 3 = 2\ 675 + 1\ 597 = 4\ 272$ |
| 2) a) $A\ 1 - B\ 1 = 4\ 254 - 2\ 697 = 1\ 557$ | d) $A\ 1 - D\ 3 = 4\ 254 - 1\ 597 = 2\ 657$ |
| b) $A\ 1 - C\ 1 = 4\ 254 - 659 = 3\ 595$ | e) $A\ 2 - B\ 2 = 3\ 672 - 2\ 825 = 847$ |
| c) $A\ 1 - D\ 1 = 4\ 254 - 591 = 3\ 663$ | f) $A\ 2 - C\ 2 = 3\ 672 - 1\ 098 = 2\ 574$ |

2.8.7 Lesson 7: Multiply a two-digit or three-digit number by a two digit number where the product does not exceed 5 000

a) Objectives

Knowledge:

Understanding the meaning of multiplication of a 3 digit number by a two digit number **where the product does not exceed 5 000**

Skills:

Multiply correctly a 3 digit number by a two digit number.

Values

Having self confidence in performing the product of numbers.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:
 - Work out different activities for multiplying a 2 digit number by a two digit number as it was learnt in unit 1.

c) Teaching resources and learning resources

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

d) Teaching and learning activities:

- Form groups of pupils and assign them to do the **activity 2.10.1** 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 assessment 2.110 and move around to each group to verify their performance;
- Ask some groups to present answers and then guide the whole class to harmonize by explaining how to do it.

e) 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.

f) Assessment

- Provide application activities to be done by pupils (the application activity 2.10) and check their answers;
- Assign homework to all pupils.

g) Answer for activities

Answer for activity 2. 10

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

Answer for pair assessment 2.10

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) $368 \times 13 = 4\ 784$		

Answer for application activity 2.10

a) $156 \times 29 = 4\ 524$	d) $156 \times 24 = 3\ 744$
b) $156 \times 19 = 2\ 964$	e) $156 \times 31 = 1\ 736$
c) $156 \times 18 = 2\ 808$	f) $156 \times 13 = 2\ 028$

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 (givens and requests), draw visual representations and solve the problem using the subtraction*.

Start by guiding pupils to solve some problems in groups or in a whole class discussion (use activity 2.11), provide problems to be solved into groups or in pairs (pair assessment 2.11) and then give problems to be solved individually (self assessment 2.11).

Answers for pair assessment 2.11

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

Answers for self assessment 2.11

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 solders.	The total number of all solders:	Total number of solders: $19 \times 245 = 4\ 655$

Note:

Refer to activity 2.12, the pair assessment 2.12 and the application activity 2.12 to teach a lesson showing learners how to multiply by 100 and 1000 where the product does not exceed 5 000.

Answer self assessment 2.12

- a) $42 \times 100 = 4\ 200$ d) $36 \times 100 = 3\ 600$
b) $37 \times 100 = 3\ 700$ e) $49 \times 100 = 4\ 900$
c) $2 \times 1\ 000 = 2\ 000$ f) $1 \times 1\ 000 = 1\ 000$

Answer for application activity 2.12

- a) $1\ 000 \times 3 = 3\ 000$ e) $1\ 000 \times 4 = 4\ 000$
b) $46 \times 100 = 4\ 600$ f) $35 \times 100 = 3\ 500$
c) $5 \times 1\ 000 = 5\ 000$ g) $3 \times 1\ 000 = 3\ 000$
d) $28 \times 100 = 2\ 800$ h) $2 \times 1\ 000 = 2\ 000$

2.8.8 Lesson 8: Division without a remainder of a 4-digit number less than 5 000 by a 1-digit number

a) Objectives

Knowledge:

Understanding the meaning of division of a number by another.

Skills:

Divide correctly a 4 digit number by one digit number.

Values

Having self confidence in performing the division of numbers.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to work out different activities for dividing a 3 digit number by a single digit number.

c) Teaching resources and learning resources

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

d) Teaching and learning activities:

This lesson can be taught like the lesson on multiplication learnt in unit 1. The activity 2.13 and the pair assessment 2.13 are guiding leaning activities for this lesson.

e) Synthesis/summarization

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

f) Assessment

- Provide application activities to be done by pupils (self assessment 2.13 and the application activity 2.13) and check their answers.
- Assign homework to all pupils.

Note: Through the use of the activity 2.14, Pair assessment 2.14, and Self assessment 2.14, word problems can be taught in another lesson.

g) Answer for activities

Answer for activity 2.13

- 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) $3\ 872 : 8 = 484$.

Answers for pair assessment 2.13

- 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) $4\ 856 : 7 = 708$

Answers for self assessment 2.13

- a) $4\ 985 : 5 = 997$ c) $2\ 736 : 9 = 304$
 b) $3\ 872 : 8 = 484$ d) $4\ 963 : 7 = 709$

Answers for application activity 2.13

- 1) a) $4\ 765 : 5 = 953$ c) $3\ 584 : 7 = 512$ e) $4\ 563 : 9 = 507$
 b) $4\ 698 : 6 = 783$ d) $2\ 976 : 8 = 372$ f) $2\ 976 : 6 = 496$

- 2) a) $765 : 5 = 153$ b) $496 : 4 = 124$ c) $2\ 976 : 6 = 496$

Answers for pair assessment 2.14

	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: $4\ 991 : 7 = 713$
3.	Total number of coffee seedlings : 4 986 Number of sectors: 9.	Number of seedlings for each sector = ?	Number of seedlings for each sector = $4\ 986 : 9 = 554$
4	Number of pineapples harvested: 3 795. Number of seasons: 5.	Number of pineapples to be harvested in every season = ?	Number of pineapples to be harvested in every season = $3\ 795 : 5 = 759$

Answers for self assessment 2.14

	Givens	Request	Solving
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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 barracks: 4.	Number of cabbages for each army barrack = ?	Number of cabbages for each army barrack = $4764 : 4 = 1191$
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 = $4\ 365 : 3 = 1\ 455$

2.9 Summary of the unit

Try to summarize the content for this unit.

2.10 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.

Unit key vocabularies 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.

2.11 Answers for the end unit assessment 2

- 1 a) Four thousand nine hundred 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)
$$\begin{array}{r} 412 \\ \times 12 \\ \hline 4944 \end{array}$$
 b)
$$\begin{array}{r} 105 \\ \times 47 \\ \hline 4935 \end{array}$$
 c)
$$\begin{array}{r} 209 \\ \times 19 \\ \hline 3971 \end{array}$$
 d)
$$\begin{array}{r} 124 \\ \times 35 \\ \hline 4340 \end{array}$$
 e)
$$\begin{array}{r} 137 \\ \times 36 \\ \hline 4932 \end{array}$$
 f)
$$\begin{array}{r} 108 \\ \times 45 \\ \hline 4860 \end{array}$$
- 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: $4\ 298 : 7 = 614$

2.12 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) $1\,500 \dots 5\,000$

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

c) $4\,380 \dots 4\,380$

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: $4\,572 : 9 = 508$.

UNIT 3: WHOLE NUMBERS FROM 0 UP TO 10 000

3.1 Key unit competence

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

3.3 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 Generic competences to be developed

Cooperation: developed when pupils work collaboratively in group to develop interpersonal relations and life skills;

Communication: developed when pupils discuss either in groups or in the whole class, present findings, debate etc.

Creativity and innovation: developed when pupils make number cards, apply skills in solving real life problems, etc.

Problem solving: when pupils use acquired skills to solve problems from their real life situation.

Lifelong learning: when the learner is engaged in activities showing her/him to have the need for more learning with a curiosity of applying the knowledge learnt in a range of situations.

3.5 Unit key vocabularies 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.

3.6 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 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 facilitate 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.

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

- Provide simple activities to slow learners found in this book
- Identify the level of physical impairment for some learners and facilitate them with appropriate learning resources;
- Identify talented pupils and give them more complex activities to retain them in learning without disturbing other classmates.

3.8 Sub-headings/ List of lessons

UNIT 3: WHOLE NUMBERS FROM 0 UP TO 10 000			40 Periods
	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 from 0 to 10 000 in figures	Read in figures the numbers from 0 to 10000.	1
3	Writing numbers from 0 to 10 000 in figures	Write in figures the numbers from 0 to 10000.	1
4	Reading numbers from 0 to 10 000 in words	Read numbers from 0 to 10 000 in words.	1
5	Writing numbers from 0 to 10 000 in words	Write numbers from 0 to 10 000 in words.	1
6	Partition a number between 0 and 10 000 into ones, tens, hundreds and thousands	Expand a number between 0 and 10 000 into ones, tens, hundreds and thousands.	3
7	Comparing numbers less than or equal to 10 000	Compare numbers less than or equal to 10000.	2
8	Arranging numbers less than or equal to 10 000 in ascending order	Arrange numbers less than or equal to 10000 in ascending order.	2
9	Arranging numbers less than or equal to 10 000 in descending order	Arrange numbers less than or equal to 10 000 in descending order.	2
10	Addition of numbers whose sum does not exceed 10 000 without carrying	Add numbers whose sum does not exceed 10 000 without carrying.	2
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 10000	Solve word problems involving addition of numbers whose sum does not exceed 10000.	2
15	Subtraction of numbers within 10 000 without borrowing	Subtract numbers within 10 000 without borrowing.	2
14	Subtraction of numbers within 10 000 with borrowing	Subtract numbers within 10 000 with borrowing.	2
15	Word problems involving subtraction of numbers within 10 000	Solve word problems involving subtraction of numbers within 10 000.	2

16	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
17	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.	2
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
19	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
20	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
21	Word problems involving addition and subtraction	Solve word problems involving addition and subtraction.	1
22	Word problems involving multiplication and division	Solve Word problems involving multiplication and division.	1
	End unit assessment	Count, read, write, expand, decompose, order, compare, add, subtract, multiply, divide whole numbers less than or equal to 10 000.	2

3.9 Teaching and learning activities

3.9.1 Lesson 1: Reading and writing numbers from 0 to 10 000

a) Objectives

Knowledge:

Use correct language when reading whole numbers from 0 to 10 000 in figures and in words

Skills:

Read and write correctly whole numbers less than 10 000.

Values

Develop the spirit of orderliness in daily activities.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;

➤ Guide pupils to:

- Work out different activities for reading and writing numbers less than 5 000 given from the the unit 2;
- Draw the table of place value and complete in it numbers less than 5 000 read from the number cards.

c) 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.

d) Teaching and learning activities:

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

e) 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 read and write that number.

f) 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.

g) Answer for activities

Answer for activity 3.1.1: Guide pupils to read numbers correctly.

Example: 6143: Six thousand, one hundred forty three.

Answer for activity 3.2

Answers may be different, guide learner to write numbers correctly

Example: 6 789: Six thousand, seven hundred eighty nine.

Answer for application activity 3.2

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

Answer for self assessment 3.2

Pupils will read and write them in figure and in words:

- 1) 5 018; 5 019.
- 2) 6 031; 6 032; 7 659
- 3) 7 652; 7 653; 7 654.
- 4) 8 098; 8 099.
- 5) 9 122.
- 6) 9 267; 9 268.

Answers for application activity 2 .2

- 1) a) Nine thousand, two hundred forty nine.
b) 6 819
- 2) Answers differ from a group to another. Verify if they are correct. Example: 8 432
- 3) 9 199, 9 399, 9 599, 9 799, 9 999.
- 4) a) A = Nine thousand seven hundred ninety four.
b) A2= 6 805
c) A3= Six thousand seven hundred thirty two.
d) B1= 7 305
e) B2= Five thousand, nine hundred thirty six.
f) B3= 8 709.
g) C1= Eight thousand, nine hundred thirty five.
h) C2= 9 557
i) C3= Eight thousand, seven hundred nineteen.

3.9.2 Lesson 2: Partition a number between 0 and 5 000 into ones, tens, hundreds and thousands

a) Objectives

Knowledge:

Understanding the place value of each digit in a four digit numbers.

Skills:

Decomposing numbers less than or equal to 10 000 into ones, tens, hundreds and thousands.

Values

Develop the capacity of quick critical thinking

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:

- Work out different activities for partitioning **numbers between 0 and 5 000 into ones, tens, hundreds and thousands** as it was learnt in the unit 2.
- Draw the table of place value and complete in it numbers less than 5 000 read from the number cards.

c) 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.

d) Teaching and learning activities:

This lesson is taught like the lesson 2 seen in unit 1 related to portioning a number into ones, tens, hundreds and thousands. Use the activity 3.3.1 and activity 3.3.2.

e) 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).

f) Assessment

- Provide application activities to be done by pupils (see pair assessment 3.3 and application activity 3.3) and check their answers.
- Assign all pupils a home work.

g) Answer for activities

Answers for activity 3.3.1:

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 for each number like in the answer of activity 1.3.1.

- $28\ 654 = \dots$ Thousands...Hundreds ...Tens...Ones.
- $6\ 974 = \dots$ Tens...Thousands...Ones...Hundreds.

- c. $7\ 935 = \dots$ Hundreds... Ones... Thousands... Tens.
 d. $5\ 923 = \dots$ Ones... Hundreds... Tens... Thousands.
 e. $6\ 179 = \dots$ Tens... Hundreds... Thousands... Ones.
 f. $9\ 756 = \dots$ 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

Answers for activity 3.3.2:

- 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) $7\ 574 = 7$ Thousands + 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) $8\ 659 = 8$ Thousands + 6 Hundreds + 5 Tens + 9 Ones.

Answer for the pair assessment 3.3

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

Answer for application activity 3.3

- 1) a) 9Thousands d) 5 tens
 b) 7ones e) 5 thousands
 c) 2hundreds f) 5 hundreds.
- 2)
- a) 8 ones, 5thousands, 7 tens, 9 hundreds = 5 978
 b) 3 ones, 6 tens, 3 thousands, 1 hundreds = 6 163
 c) 3 tens, 7thousands, 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
- 3) a) $8\ 567 = 8$ thousands, 5 hundreds, 6 tens 7 ones.
 b) $7\ 526 = 7$ thousands, 5 hundreds, 2 tens 6 ones

c) $9\ 615 = 9\ \text{thousands} , 6\ \text{hundreds} , 1\ \text{tens} \ 5\ \text{ones}$

d) $6\ 452 =$

e) $6\ 435 =$

f) $7\ 361 =$

3.9.3 Lesson 3: Comparing numbers less than or equal to 10 000

a) Objectives

Knowledge:

Understand how to compare numbers less than or equal to 10 000.

Skills:

Compare and order numbers less than or equal to 10 000.

Values

Develop the capacity of quick critical thinking to compare quantities of things.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:
 - Work out different activities for comparing **number between 0 and 5 000**.
 - Read numbers less than 5 000 from the number cards, draw the table of place value and complete numbers in it.

c) 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.

d) Teaching and learning activities:

This lesson is taught like the lesson 3 seen in unit 1. But numbers to be compared are between 5 000 and 10 000 and you will use the activity 3.4.1, activity 3.4.2 and activity 3.4.3.

e) 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).

f) Assessment

- Provide application activities to be done by pupils (use the pair assessment 3.4 and self assessment 3.4) and check their answers;
- Assign all pupils to do the application activity 3.4 as homework.

g) Answer for activities

Answers for activity 3.4.1

- a) $7\ 456 < 8\ 336$ b) $9\ 576 > 9\ 321$

Answers for activity 3.4.3

- 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) $6\ 072 = 6\ 072$

Answers for pair assessment 3.4

- 1) a) Munanira II b) Nyakabanda II
2) 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) $7\ 865 > 6\ 896$.

Answers for self assessment 3.4

- a) $2\ 087 > 1\ 678$ b) $2\ 087 < 6\ 167$ c) $1\ 678 > 6\ 167$

Answers for application activity 2.4

- 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) $7\ 835 < 8\ 435$

3.9.4 Lesson 4: 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

Knowledge:

Understand the meaning of more things that do not exceed 10 000 and few things.

Skills:

Arrange numbers less than or equal to 10 000 in a given order.

Values

Develop the capacity of ordering objects depending on their quantities.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:

- Work out different activities for arranging numbers **between 0 and 5 000 in an ascending or descending order**;

- Read numbers less than 5 000 from the number cards, complete them in the table of place values and order them in a given order.

c) 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.

d) Teaching and learning activities:

This lesson for arranging numbers between 5 000 and 10 000 in ascending or descending order is taught similarly with the lesson of arranging numbers between 0 and 1 000 learnt in the unit one. Use the activity 3.5.1, activity 3.5.2, activity 3.5.3 and activity 3.5.4.

e) 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 facilitate the comparison and then the arrangement of numbers.

f) Assessment

- Provide application activities to be done by pupils (self assessment 3.5 and the application activity 3.5) and check their answers.
- Assign homework to all pupils.

g) Answer for activities

Answers for activity 3.5.1

- 1) 6 439, 7 564, 8 943, 9 754, 9 825. 3) 5 739, 7 193, 7 496, 8 049, 9 384
 2) 5 482, 6 357, 6 497, 7 845, 8 015. 4) 6 427, 7 409, 8 274, 8 391, 9 437

Answers for activity 3.5.2

- 1) $5\ 386 < 6\ 218 < 7\ 804$ 2) $5\ 748 < 6\ 804 < 7\ 358$

Answers for activity 3.5.3

- 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.

Answers for activity 3.5.4

- 1) 8 534, 7 483, 5 192. 3) 8 976, 7 456, 6 012.
 2) 9 567, 7 345, 6 978. 4) 9 271, 7 105, 6 823.

Answers for self assessment 3.5

- a) 9 375; 8 156; 7 247; 6 015 b) 7 542; 7 524; 7 254; 7 245.

Answers for application activity 3.5

- 1) a) 7 869; 8 687; 9 876. b) 5 678, 7 658, 7 856. c) 4 576, 5 746, 6 475, 7 654.
 2) a) 9 325, 5 923, 5 392 b) 6 541; 6 154; 5614; 5 146. c) 9 876, 7 698, 6789.

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

a) Objectives

Knowledge:

Understanding the addition of numbers whose sum does not exceed 1 000 with or without carrying.

Skills:

Addition of numbers whose sum does not exceed 5 000 with and without carrying.

Values

Having self confidence in performing the sum of objects.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:
 - Work out different activities for adding numbers whose sum does not exceed **5 000** learnt in the previous unit.
 - Read small numbers from the number cards, complete them in the table of place values and add them.

c) 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.

d) 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 3.6.1, activity 3.6.2 and the activity 3.7.

e) 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.

f) Assessment

- Assign pupils to work in pair, work out pair assessment 3.6.1 and 3.6.2 and verify their answers
- Provide activities to be done by pupils (self assessment 3.6.1 and 3.6.2) and check their answers;
- Assign homework to all pupils (use application activity 3.6.1 and 3.6.2) .

g) Answer for activities

Answers for activity 3.6.1

a) $\begin{array}{r} 6\ 543 \\ + 2\ 310 \\ \hline 8\ 853 \end{array}$	b) $\begin{array}{r} 4\ 567 \\ + 3\ 421 \\ \hline 7\ 988 \end{array}$	c) $\begin{array}{r} 5\ 123 \\ + 3\ 754 \\ \hline 8\ 877 \end{array}$	d) $\begin{array}{r} 9\ 217 \\ + \quad 682 \\ \hline 9\ 899 \end{array}$	e) $\begin{array}{r} 8\ 012 \\ + \quad 987 \\ \hline 8\ 999 \end{array}$
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Answers for self assessment 3.6.1

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) $4\ 650 + 4\ 239 = 8\ 889$

Answers for pair assessment 3.6.2

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) $6\ 123 + 2\ 874 = 8\ 997.$

Answers for Application activity 3.6.1

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

Answers for activity 2.6.2

a) $\begin{array}{r} 4\ 989 \\ + 3\ 465 \\ \hline 8\ 454 \end{array}$	b) $\begin{array}{r} 5\ 345 \\ + 2\ 987 \\ \hline 8\ 332 \end{array}$	c) $\begin{array}{r} 6\ 578 \\ + 2\ 456 \\ \hline 9\ 034 \end{array}$	d) $\begin{array}{r} 8\ 123 \\ + 1\ 098 \\ \hline 9\ 221 \end{array}$	e) $\begin{array}{r} 7\ 145 \\ + 1\ 879 \\ \hline 9\ 024 \end{array}$
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Answers for pair assessment 3.6.2

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

Answers for self assessment 3.6.2

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) $6\ 467 + 2\ 944 = 9\ 411.$

Answers for Application activity 3.6.2

a) $\begin{array}{r} 7\ 568 \\ + 1\ 928 \\ \hline 9\ 496 \end{array}$	b) $\begin{array}{r} 8\ 532 \\ + \quad 987 \\ \hline 9\ 519 \end{array}$	c) $\begin{array}{r} 9\ 274 \\ + \quad 389 \\ \hline 9\ 663 \end{array}$	d) $\begin{array}{r} 6\ 765 \\ + 2\ 579 \\ \hline 9\ 344 \end{array}$	e) $\begin{array}{r} 4\ 723 \\ + 5\ 187 \\ \hline 9\ 910 \end{array}$
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Note:

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 (givens and requests)*,
- *draw visual representations and solve the problem using the addition.*

Start by guiding pupils to solve some problems in groups or in a whole class discussion (use activity 3.7), provide problems to be solved into groups or in pairs

(pair assessment 3.7) and then give problems to be solved individually (self assessment 3.7).

Answers for pair assessment 2.7

N ^o	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 self assessment 3.7

N ^o	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 = $3\,576 + 5\,879 = 9\,455$
4	Number of boxes of soap made last month: 4 653. Number of boxes of soap made this month: 4 978.	Total number of boxes = ?	Total number of boxes: $4\,653 + 4\,978 = 9\,631$

3.9.6 Subtraction of numbers within the range of 10 000

a) Objectives

Knowledge:

Understanding the subtraction of numbers less than 10 000 with or without borrowing.

Skills:

Subtract a number from another without or with borrowing.

Values

Having self confidence in performing the difference two numbers.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:
 - Work out different activities for finding the difference of numbers less than 5 000 learnt in the unit 2.
 - Read numbers from two number cards, complete them in the table of place values and perform the subtraction to find the difference.

c) 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.

d) 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 3.8.1, activity 3.8.2 and the activity 3.9 respectively.

e) 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.

f) Assessment

- Assign pupils to work in pair, work out pair assessment 3.8.1 or pair assessment 3.8.2 and verify their answers.
- Provide activities to be done by pupils (self assessment 3.8.1 or self assessment 3.8.2) and check their answers.
- Assign a homework to be done by pupils (you can use application activity 3.8.1 and 3.8.2).

g) Answer for activities

Answers for activity 3.8.1

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

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

Answers for pair assessment 3.8.1

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) $6\ 345 - 4\ 203 = 2\ 142$	

Answers for self assessment 3.8.1

a) $9\ 745 - 5\ 203 = 4\ 542$	d) $6\ 789 - 5\ 456 = 1\ 333$
b) $7\ 256 - 4\ 032 = 3\ 224$	e) $5\ 876 - 4\ 674 = 1\ 202$
c) $8769 - 3539 = 5230$	f) $9\ 863 - 4\ 730 = 5\ 133$

Answers for application activity 3.8.1

a) $8\ 589$	b) $7\ 953$	c) $6\ 789$	d) $5\ 765$
$\underline{-\ 5\ 046}$	$\underline{-\ 5\ 720}$	$\underline{-\ 5\ 417}$	$\underline{-\ 3\ 612}$
3 543	2 233	1 372	2 153

Answers for activity 3.8.2

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

Answers for pair assessment 3.8.2

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) $7\ 431 - 5\ 865 = 1\ 566$		

Answers for self assessment 3.8.2

a) $9\ 013 - 7\ 457 = 1\ 556$	c) $7\ 432 - 5\ 678 = 1\ 754$	e) $5\ 376 - 389 = 3\ 987$
b) $8\ 234 - 6\ 957 = 1\ 277$	d) $6\ 543 - 4\ 675 = 1\ 868$	f) $5\ 021 - 2\ 658 = 2\ 363$

Answers for application activity 3.8.2

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

Note:

Concerning **the lesson on word problems involving subtraction**, the teacher will 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 whole class discussion (use activity 3.9), provide problems to be solved into groups or in pairs (**pair assessment 3.9**) and then give problems to be solved individually (**self assessment 3.9**).

Answers for pair assessment 3.9

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

Answers for Self assessment 2.9

- 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: $9\,351 - 7\,984 = 1\,367$

Answers for application activity 3.9

- | | |
|----------------------------------|-------------------------------|
| 1) a) $5\,674 + 3\,789 = 9\,463$ | d) $6\,987 + 1\,979 = 8\,966$ |
| b) $5\,674 + 4\,098 = 9\,772$ | e) $7\,486 + 1\,947 = 9\,433$ |
| c) $6\,987 + 2\,678 = 9\,665$ | f) $7\,486 + 1\,287 = 8\,773$ |
-
- | | |
|----------------------------------|-------------------------------|
| 2) a) $5\,674 - 3\,789 = 1\,885$ | d) $6\,987 - 2\,678 = 4\,309$ |
| b) $5\,674 - 4\,098 = 1\,576$ | e) $6\,987 - 1\,979 = 5\,008$ |
| c) $4\,098 - 3\,789 = 309$ | f) $2\,678 - 1\,979 = 699$ |

3.9.7 Lesson 7: Multiply a two-digit or three-digit number by a two digit number where the product does not exceed 10 000

a) Objectives

Knowledge:

Understanding the meaning of multiplication of a 3 digit number by a two digit number where the product does not exceed 10 000.

Skills:

Multiply correctly a 3 digit number by a two digit number.

Values

Having self confidence in performing the product of numbers.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:

- Work out different activities for multiplying a 3 digit number by a two digit number as it was learnt in unit 2.

c) Teaching resources and learning resources

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

d) 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 similarly with the same lesson taught in unit 2. Refer to that lesson (lesson 7 of unit 2) but you have to use the activity 3.10.

e) 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.

f) Assessment

- Provide pair assessment (3.10) , self assessment (3.10) and application activities to be done by pupils (the application activity 3.10) and check their answers.
- Assign homework to all pupils.

g) Answer for activities

Answer for activity 3. 10

a) 295	b) 198	c) 356	d) 139	e) 108
$\begin{array}{r} \times 15 \\ \hline 4\ 425 \end{array}$	$\begin{array}{r} \times 19 \\ \hline 3\ 762 \end{array}$	$\begin{array}{r} \times 12 \\ \hline 4\ 272 \end{array}$	$\begin{array}{r} \times 34 \\ \hline 4\ 726 \end{array}$	$\begin{array}{r} \times 45 \\ \hline 4\ 860 \end{array}$

Answer for pair assessment 3.10

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) $638 \times 15 = 9\ 570$		

Answer for self assessment 3.10

a) 789	b) 697	c) 874	d) 527	e) 472
$\begin{array}{r} \times 12 \\ \hline 9\ 468 \end{array}$	$\begin{array}{r} \times 13 \\ \hline 9\ 061 \end{array}$	$\begin{array}{r} \times 11 \\ \hline 9\ 614 \end{array}$	$\begin{array}{r} \times 15 \\ \hline 7\ 905 \end{array}$	$\begin{array}{r} \times 16 \\ \hline 7\ 552 \end{array}$

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 (givens and requests), draw visual representations and solve the problem using the subtraction.*

Start by guiding pupils to solve some problems in groups or in a whole class discussion (use activity 3.11), provide problems to be solved into groups or in pairs (pair assessment 3.11) and then give problems to be solved individually (self assessment 3.11).

Answers for pair assessment 3.11

- 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: $479 \times 18 = 8\,622$

Answers for self assessment 3.11

- 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: $589 \times 15 = 8\,835$.

Note:

Refer to activity 3.12.1, 3.12.2 and 3.12.3, the self assessment 3.12 and the application activity 3.12 to teach a lesson showing learners how to multiply by 100 and 1000 where the product does not exceed 10 000.

Answers for activity 3.12.2

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

Answers for self assessment 3.12

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

Answer for application activity 3.12

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

3.9.8 Lesson 8: Division without a remainder of a 4-digit number less than 10 000 by a one digit number

a) Objectives

Knowledge:

Understanding the meaning of division of a number by another.

Skills:

Divide correctly a 4-digit number by one digit number.

Values

Having self confidence in performing the division of numbers.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to work out different activities for dividing a 3 digit number by a single digit number learnt in unit 2.

c) Teaching resources and learning resources

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

d) Teaching and learning activities:

This lesson can be taught like the lesson 8 on the multiplication learnt in unit 1. Use the activity 3.13 and the pair assessment 3.13 as guiding leaning activities for this lesson.

e) Synthesis/summarization

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

f) Assessment

- Provide activities to be done by pupils (self-assessment 3.13 and the application activity 3.13) and check their answers.
- Assign homework to all pupils.

g) Answer for activities

Answer for activity 3.13

- 1) $7\,496 : 8 = 937$ 2) $6\,327 : 9 = 903$ 3) $7\,049 : 7 = 1\,007$

Answers for pair assessment 3.13

- a) $8\,984 : 8 = 1\,123$ d) $8\,172 : 9 = 908$ f) $8\,491 : 7 = 1\,213$
b) $6\,576 : 4 = 1\,644$ e) $7\,985 : 5 = 1\,597$ g) $9\,879 : 3 = 3\,293$
c) $8\,952 : 6 = 1\,492$.

Answers for self assessment 3.13

- a) $9\,549 : 9 = 1\,061$. c) $7\,952 : 7 = 1\,136$. e) $6\,585 : 5 = 1\,317$.
b) $8\,728 : 8 = 1\,091$. d) $6\,906 : 6 = 1\,151$. f) $8\,976 : 4 = 2\,244$.

Answers for application activity 3.13

- a) $9\,878 : 2 = 4\,939$ c) $5\,392 : 4 = 1\,348$ e) $7\,656 : 6 = 1\,276$.

$$b) 7\ 839 : 3 = 2\ 613$$

$$d) 8\ 965 : 5 = 1\ 793$$

$$f) 6\ 398 : 7 = 914.$$

Note:

Through the use of the activity 3.14, Pair assessment 3.14, and Self-assessment 3.14, word problems can be taught in another lesson.

Answers for pair assessment 3.14

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

Answers for self-assessment 3.14

- 1) The number of pineapples to be loaded in each lorry = $5\ 496 : 8 = 687$
- 2) The number of students received by each school = $7\ 895 : 5 = 1\ 579$
- 3) The number of sacks will be received by each district = $8\ 793 : 9 = 977$
- 4) The number of laptops to be distributed to each district = $6\ 797 : 7 = 971$.

3.10 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;
- 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.

c) 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) $6\,574 + 2\,695 = 9\,269$ b) $7\,865 + 1\,879 = 9\,744$

c) $5\,679 + 4\,320 = 9\,999$ d) $6\,958 + 2\,794 = 9\,752$

9) a) $7\,856 - 5\,976 = 1\,880$ b) $8\,761 - 6\,819 = 1\,942$

c) $9\,852 - 8\,974 = 878$ d) $6\,265 - 5\,987 = 278$.

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

11) a) $7\,985 : 5 = 1\,597$ b) $8\,526 : 6 = 1\,421$

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: $981 : 9 = 109$.

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 whole 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 Generic competences to be developed

Cooperation: developed when pupils work collaboratively in group to develop interpersonal relations and life skills;

Communication: developed when pupils discuss either in groups or in the whole class, present findings, debate etc.

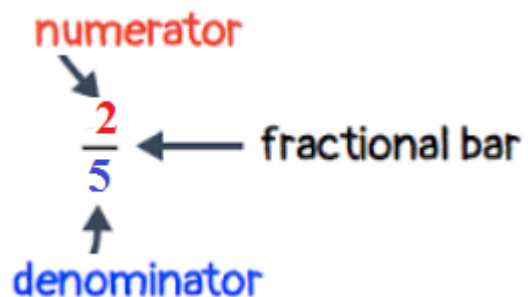
Creativity and innovation: developed when pupils make number cards, apply skills in solving real life problems, etc.

Problem solving: when pupils use acquired skills to solve problems from their real life situation.

Lifelong learning: when the learner is engaged in activities showing her/him to have the need for more learning with a curiosity of applying the knowledge learnt in a range of situations.

4.5 Unit key vocabularies or concepts

- **Numerator:** The top number of a fraction
- **Denominator:** The bottom number of a fraction
- **Fractional bar:** a small bare separating a numerator and a denominator.
- **A whole:** it is one unit equivalent to a fraction whose numerator equals to a denominator.
- **Proper fraction:** numerator is less than the denominator.
- **Improper fraction:** numerator is greater than or equal to denominator.
- **Mixed number:** whole number and a fraction.



4.6 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 whole;
- 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 whole;
- 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 facilitate 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.

4.7 Guidance on how to help learners with special education needs

- Provide to slow learners simple activities found in this book;
- Identify the level of physical impairment for some learners and facilitate them with appropriate learning resources;
- Identify talented pupils and give them more complex activities to retain them in learning without disturbing other classmates.

4.8 Sub-headings /List of lessons

UNIT 4: FRACTIONS HAVING A DENOMINATOR NOT GREATER THAN 10			16 Periods
	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 not exceeding a whole and having a denominator less than or equal to 10	Read and write fractions not exceeding a whole and having a denominator less than or equal to 10.	2
3	Shading colours and illustrating fractions not exceeding a whole	Shade colours and illustrate fractions not exceeding a whole.	1
4	Comparing fractions not exceeding a whole and having a denominator less than or equal to 10	Compare fractions not exceeding a whole and having a denominator less than or equal to 10.	2
5	Addition of fractions having common denominators less than or equal to 10 but not exceeding a whole	Add fractions having common denominators less than or equal to 10 but not exceeding a whole.	2
6	Subtraction of fractions having common denominators less than or equal to 10 but not exceeding a whole.	Subtract fractions having common denominators less than or equal to 10 but not exceeding a whole.	2

7	Finding the complement of a fraction for forming a unit fraction	Find the complement of a fraction for forming a unit fraction.	1
8	Fraction of a number for real objects	Be able to find a fraction of a number for real objects.	1
9	Fraction of a whole number	Be able to find a fraction of a whole number.	1
10	Word problems involving fraction of a whole number	Solve word problems involving fraction of a whole number.	2
	End unit assessment	Work 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 whole number.	1

4.9 Teaching and learning activities

4.9.1 Lesson 1: Reading and writing fractions not exceeding a whole and having a denominator less than or equal to 10

a) Objectives

Knowledge:

Understanding the meaning of a fraction

Skills:

- Cut a whole into equal portions (shares) that make fractions.
- Show portions of fractions that make a whole.
- Read and write correctly a fraction whose denominator is less or equal to 10.

Values

- Develop the spirit of equal sharing.
- Show the concern of trustworthiness when sharing with others.

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 whole whose denominator is less than 10.

c) Teaching resources and learning resources

- Different objects to be cut: sugar cane, oranges, sticks, soap, sheets of paper, etc.
- Safe materials to be used: scissors or plastic knife to cut a whole 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);
- 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.
- Ask pupils for each group to discuss the findings for its members;
- Ask some groups to present the findings and guide the whole class to harmonize how to read fractions.
- Ask pupils to join their groups and do the activity 4.1.2.

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 pair assessment 4.1 and application activity 4.1).

g) Answer for activities

Answer for pair assessment 4.1

- a) $\frac{1}{2}$ b) $\frac{2}{8}$ c) $\frac{2}{4}$

Answer for 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) $\frac{2}{9}$

4.9.2 Lesson 2: Shading fractions not exceeding a whole and having a denominator less than or equal to 10

a) Objectives

Knowledge:

Understanding the fractions and a whole.

Skills:

Draw and shade fractions using different colors.

Values

- Develop the spirit of equal sharing.
- Show the concern of trustworthiness when sharing with others.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:
 - Work out different activities for reading and writing different fractions in words;
 - Organize learning materials to be used by pupils.

c) Teaching resources and learning resources

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

d) Teaching and learning activities:

- Invite one pupil and guide him/her on how to shade color on a portion representing a fraction on the chalk board(use for example activity 4.2.1);
- Organize groups of pupils and give them activities to do (for example Activity 4.2.2, and 4.2.3).
- 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 shade or how to illustrate a fraction.

e) Synthesis/summarization

Guide pupils to summarize how to shade or how to illustrate a fraction.

f) Assessment

- Provide activities to be done by pupils (see application activity 4.2) and check their answers.
- Assign all pupils a homework.

g) Answer for activities

Answer for application activity 4.2

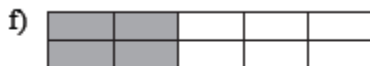
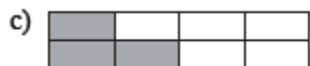


$\frac{4}{5}$: four fifth or four out of five

$\frac{7}{9}$: seven ninth or seven out of nine.

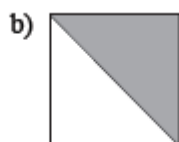
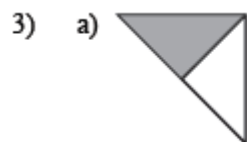
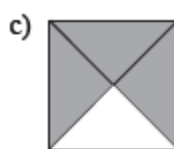
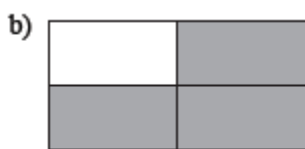
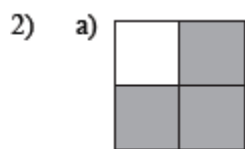


$\frac{2}{3}$ two over three or two out of 3 or two third $\frac{6}{7}$: six seventh or six over seven



$\frac{3}{8}$:

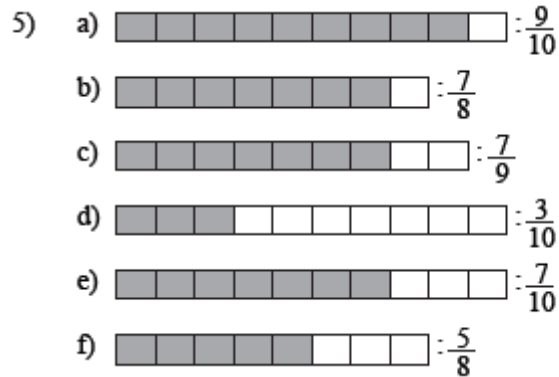
$\frac{4}{10}$:



4) a) $\frac{1}{2}$:

b) $\frac{3}{8}$:

c) $\frac{4}{4}$



4.9.3 Lesson 3: Comparing fractions not exceeding a whole and having common denominators up to 10

a) Objectives

Knowledge:

Understand how to compare fractions **not exceeding a whole and having common denominators up to 10**

Skills:

Compare fractions **not exceeding a whole and having common denominators up to 10**

Values

- Develop the capacity of quick critical thinking to compare fractions.
- Develop the spirit of equal sharing.
- Show the concern of trustworthiness when sharing with others.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:
 - Work out different activities for shading fractions to show equal portions of a whole;
 - Read numbers fractions not exceeding a whole of the same denominator up to 10.
 - Recognize fractions as equal shares of a whole set.
 - Recognise one whole, one half, one quarter and three quarters in contexts.

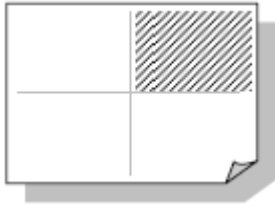
c) Teaching resources and learning resources

- Different objects to be cut: sugar cane, oranges, sticks, soap, sheets of paper, etc.

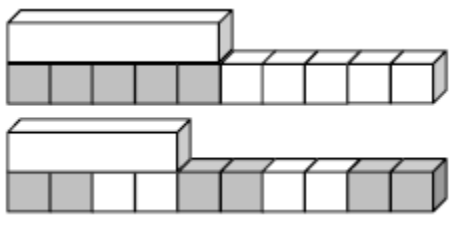
- Safe materials to be used: scissors or plastic knife to cut a whole into portions of equal sizes;
- Semi concrete objects: drawings illustrating different fractions, rectangles, squares, circles, etc.

d) 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 Cuisenaire rods or equal parts of n orange



- Ask other pupils to say the fraction of the shaded part and the fraction for the non shaded parts and ask them to compare fractions they find.
- 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 4.3.1), 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 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 fractions of a same denominator up to 10.

e) Synthesis/summarization

- Guide pupils to summarize how to compare fractions of a same denominator up to 10.
- Emphasize fraction as: *equal size portions of a whole or as equal shares of a whole set.*

f) Assessment

- Provide activities to be done by pupils (use the pair assessment 4.3) and check their answers;
- Assign all pupils to do the application activity 3.4 as homework.

g) Answer for activities

Answers for activity 4.3.1

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) $\frac{1}{4} < \frac{4}{4}$

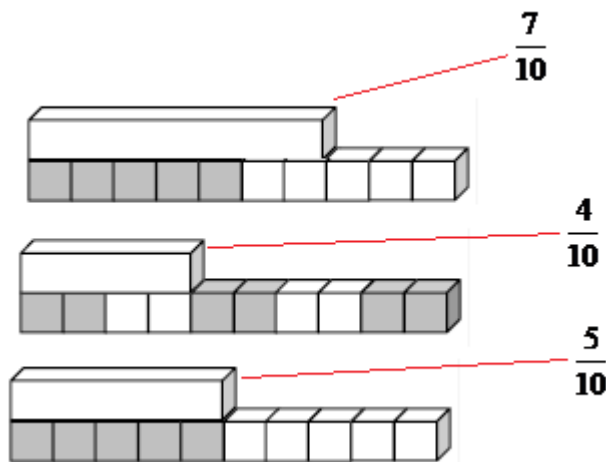
Answers for pair assessment 4.3

a) $\frac{1}{3} < \frac{2}{3}$ b) $\frac{1}{4} < \frac{3}{4}$ c) $\frac{4}{5} > \frac{2}{5}$ d) $\frac{2}{5} < \frac{3}{5}$
 e) $\frac{4}{7} > \frac{1}{7}$ f) $\frac{5}{6} = \frac{5}{6}$ g) $\frac{1}{6} < \frac{4}{6}$ h) $\frac{1}{10} < \frac{7}{10}$ 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 sugar can 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:



and ask pupils to arrange them before assigning them to do the **activity 4.4.2**.

Answers for application activity 4.4.1

a) $\frac{1}{10}, \frac{2}{10}, \frac{3}{10}, \frac{5}{10}, \frac{6}{10}$ b) $\frac{1}{9}, \frac{2}{9}, \frac{3}{9}, \frac{4}{9}, \frac{5}{9}, \frac{6}{9}$
 c) $\frac{1}{8}, \frac{2}{8}, \frac{3}{8}, \frac{5}{8}, \frac{6}{8}$ d) $\frac{4}{10}, \frac{7}{10}, \frac{8}{10}, \frac{9}{10}$

Answers for activity 4.4.2

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) $\frac{3}{3}, \frac{2}{3}, \frac{1}{3}$

Answers for self assessment 4.4

1) a) $\frac{2}{7}, \frac{3}{7}, \frac{4}{7}, \frac{6}{7}, \frac{7}{7}$

b) $\frac{2}{10}, \frac{6}{10}, \frac{8}{10}, \frac{9}{10}, \frac{10}{10}$

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) $\frac{3}{3}, \frac{2}{3}, \frac{1}{3}$

4.9.4 Lesson 4: Addition of fractions not exceeding a whole and having common denominator not exceeding 10**a) Objectives****Knowledge:**

Understand the meaning of the sum of two fractions with the same denominator.

Skills:

Add fractions of the same denominator whose sum does not exceed a whole.

Values

- Develop the capacity of quick critical thinking to compare fractions.
- Develop the spirit of equal sharing.
- Show the concern of trustworthiness when sharing with others.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:

Use concrete objects and carry out different activities for putting together different portions of a whole and say the related fraction.

c) Teaching resources and learning resources

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

d) 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;
- 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 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 fractions of a same denominator which is less or equal to 10.

e) 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.**

f) Assessment

- Provide activities to be done by pupils (pair assessment 4.5) and check their answers.
- Assign homework to all pupils.

g) Answer for activities

Answers for activity 4.5.1

a) $\frac{4}{8}$ b) $\frac{9}{9}$ c) $\frac{5}{7}$ d) $\frac{3}{4}$ e) $\frac{4}{8}$ f) $\frac{9}{10}$

Answers for self assessment 4.5

a) $\frac{7}{8}$ b) $\frac{8}{10}$ c) $\frac{9}{9}$ d) $\frac{6}{7}$

Note:

Concerning **the lesson on word problems involving addition of fractions**, the teacher will help pupils to solve a one –step or a two-step problem:

- guide them to *understand the problem*,
- *identify facts (givens and requests)*,
- *draw visual representations and solve the problem using the addition.*

Start by guiding pupils to solve some problems in groups or in a whole class discussion (use activity 4.6), provide problems to be solved into groups or in pairs

(pair assessment 4.6) and then give problems to be solved individually (self assessment 4.6).

Answers for pair assessment 4.6

- 1) Fraction of homework 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 garden the cooperative harvested $\frac{2}{6} + \frac{3}{6} = \frac{5}{6}$
- 4) Fraction of the sugar he sold $\frac{2}{10} + \frac{7}{10} = \frac{9}{10}$

Answers for self assessment 4.6

- 1) Fraction of a basket he waived during three days $\frac{2}{7} + \frac{3}{7} + \frac{1}{7} = \frac{6}{7}$
- 2) Fraction of a bread they eat altogether $\frac{5}{10} + \frac{3}{10} = \frac{8}{10}$
- 3) Fraction of slashed garden $\frac{4}{9} + \frac{2}{9} = \frac{6}{9}$
- 4) Fraction of the journey he covered $\frac{3}{8} + \frac{4}{8} = \frac{7}{8}$

4.9.5 Lesson 5: Subtraction of fractions not exceeding a whole and having common denominator less than or equal to 10

a) Objectives

Knowledge:

Understand the meaning of the difference of two fractions with the same denominator.

Skills:

Subtract fractions of the same denominator **less than or equal to 10** .

Values

- Develop the capacity of quick critical thinking to find the difference of fractions.
- Develop the spirit of equal sharing.
- Show the concern of trustworthiness when sharing with others.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:

Use concrete objects and carry out different activities for putting away a portion of a whole and say the remaining fraction.

c) Teaching resources and learning resources

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

d) 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 Cuisenaire rods and ask pupils to cut one portion and put it away and say the fraction of the remained portion;
- Organize groups of pupils and give them activities to do (for example Activity 4.7.1), 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 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 of fractions with a same denominator which is less or equal to 10.

e) 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.**

f) Assessment

- Provide activities to be done by pupils (self assessment 4.7) and check their answers.
- Assign homework to all pupils.

g) Answer for activities

Answers for activity 4.7.1

$$\begin{array}{lll} \text{a)} & \frac{7}{9} - \frac{4}{9} = \frac{3}{9} & \text{c)} \quad \frac{5}{6} - \frac{4}{6} = \frac{1}{6} & \text{e)} \quad \frac{4}{5} - \frac{2}{5} = \frac{2}{5} \\ \text{b)} & \frac{8}{9} - \frac{7}{9} = \frac{1}{9} & \text{d)} \quad \frac{5}{8} - \frac{4}{8} = \frac{1}{8} & \text{f)} \quad \frac{10}{10} - \frac{8}{10} = \frac{2}{10} \end{array}$$

Answers for self assessment 4.7

$$\begin{array}{ll} \text{a)} \quad \frac{9}{10} - \frac{4}{10} - \frac{3}{10} = \frac{2}{10} & \text{b)} \quad \frac{8}{8} - \frac{1}{8} - \frac{6}{8} = \frac{1}{8} \\ \text{c)} \quad \frac{7}{9} - \frac{2}{9} - \frac{3}{9} = \frac{2}{9} & \text{d)} \quad \frac{6}{7} - \frac{3}{7} - \frac{2}{7} = \frac{1}{7} \end{array}$$

Note:

Concerning **the lesson on word problems involving subtraction of fractions**, the teacher will help pupils to solve a one –step or a two-step problem:

- guide them to *understand the problem*,
- *identify facts (givens and requests)*,
- *draw visual representations and solve the problem using the addition.*

Start by guiding pupils to solve some problems in groups or in a whole class discussion (use activity 4.8), provide problems to be solved into groups or in pairs (**pair assessment 4.8**) and then give problems to be solved individually (**self assessment 4.8**).

Answers for pair assessment 4.8

$$1) \quad \frac{6}{10} \qquad 2) \quad \frac{4}{9} \qquad 3) \quad \frac{6}{10}$$

Answers for self assessment 4.8

1) The fraction of trees which did not grow	$\frac{6}{7} - \frac{3}{7} = \frac{3}{7}$
2) Fraction of maize flour he remained with	$\frac{4}{5} - \frac{3}{5} = \frac{1}{5}$
3) Fraction of clothes not dried up	$\frac{7}{8} - \frac{5}{8} = \frac{2}{8}$

4.9.6 Lesson 6: Finding the complement of a fraction for forming a unit fraction

a) Objectives

Knowledge:

Understand the meaning of a whole and component of a whole when divided into equal portions.

Skills:

Discover the difference of a whole and a portion of that whole.

Values

- Develop the capacity of quick critical thinking to find the difference of fractions.
- Develop the spirit of equal sharing.
- Show the concern of trustworthiness when sharing with others.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:

Use concrete objects and carry out different activities for cutting a whole into equal portions.

c) Teaching resources and learning resources

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

d) 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;
- 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.
- 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 complement of a fraction: the fraction which makes a whole – the given fraction.

e) Synthesis/summarization

Guide pupils to summarize how to find the complement of a fraction: **the fraction which makes a whole – the given fraction.**

Example: the complement of $\frac{3}{4}$ is $\frac{4}{4} - \frac{3}{4} = \frac{4-3}{4} = \frac{1}{4}$.

f) Assessment

- Provide activities to be done by pupils (pair assessment 4.9) and check their answers.
- Assign homework to all pupils.

g) Answer for activities

Answer for activity 4.9.2

- 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) $\frac{2}{9}$

Answer for pair assessment 4.9

- a) $\frac{4}{7}$ b) $\frac{5}{9}$ c) $\frac{2}{8}$ d) $\frac{9}{10}$

4.9.7 Lesson 7: Fraction of a whole number

a) Objectives

Knowledge:

Understand the meaning of the fraction of whole number

Skills:

Calculate the fraction of a whole number and the fraction of a number of objects.

Values

- Develop the capacity of quick critical thinking to find the difference of fractions.
- Develop the spirit of equal sharing.
- Show the concern of trustworthiness when sharing with others.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:
 - Multiply numbers and divide the obtained product by another number;
 - Use concrete objects and find the fraction of a given number for those objects.

c) Teaching resources and learning resources

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

d) 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



- Organize groups of pupils and give them activities to do (for example Activity 4.10); You can also give them a fraction card and a whole number and ask pupils to find the number card which has the corresponding fraction of such a number.
- 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 fraction of a whole number.

e) Synthesis/summarization

Guide pupils to summarize how to find a fraction of a whole number:

(Take the number and multiply it by the numerator of a fraction): the denominator.

Example: $\frac{3}{4}$ of 20 is $\frac{3}{4}(20) = \frac{3 \times 20}{4} = \frac{60}{4} = 15$.

f) Assessment

- Provide activities to be done by pupils (self assessment 4.10 and pair assessment 4.10) and check their answers.
- Assign homework to all pupils.

g) Answer for activities

Answer for activity 4.10

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: $\frac{35 \times 4}{7} = 20$

Answer for self assessment 4.10

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: $\frac{7 \times 10}{10} = 7$

Answer for pair assessment 4.10

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: $\frac{56 \times 7}{8} = 49$

4.9.8 Lesson 8: Word problem involving fraction of a whole number whose denominator does not exceed 10

a) Objectives

Knowledge:

Understand how to solve problems involving fraction of a whole number.

Skills:

Solve problems involving fractions of a whole numbers whose denominator does not exceed 10.

Values

- Develop the capacity of quick critical thinking to find the difference of fractions.
- Develop the spirit of equal sharing.
- Show the concern of trustworthiness when sharing with others.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:

Use concrete objects and find the fraction of a given number for those objects.

c) Teaching resources and learning resources

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

d) 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 and pair assessment 4.11);
- 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 solve a problem.

e) Synthesis/summarization

Guide pupils to summarize how to solve a problem:

- guide them to *understand the problem*,
- *identify facts (givens and requests)*,
- *draw visual representations and*
- *solve the problem using the addition.*

f) Assessment

- Provide activities to be done by pupils (self assessment 4.11) and check their answers.
- Assign homework to all pupils.

g) Answer for activities

Answers for pair assessment 4.11

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: $\frac{125 \times 2}{5} = 50$

Answers for self-assessment 4.11

The number of houses which have the roofs of iron sheets and others without iron sheet

With iron sheets

$$\frac{5}{6} \text{ of } 240: \frac{240 \times 5}{6} = 200$$

Without iron sheets: $240 - 200 = 40$

Number of girls: $45 - 30 = 15$

$$\frac{2}{3} \text{ of } 45: \frac{45 \times 2}{3} = 30$$

Number of boys:

Number of cars that operate in the provinces

$$\frac{4}{7} \text{ of } 84: \frac{84 \times 4}{7} = 48$$

Note:

Concerning the lesson on the importance of fractions, the teacher will arrow pupils to discuss the importance of fraction basing on their dairy experiences. Use activity 4.12.1, activity 4.12.3and 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 sugar cane at home, what fraction can the following people take? The father, the mother, you, your sister or your brother.

4.10 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;
- Introduces the concept of fractions using concrete objects and manipulative materials;
- Teach pupils different ways of reading fractions, for example the fraction $1/5$ is “one over five” 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.

c) 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:

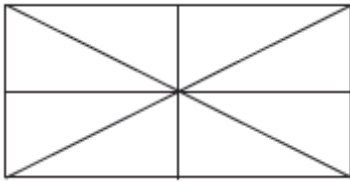
As a teacher, after this assessment, you have to provide remedial activities, consolidation and extension activities.

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=

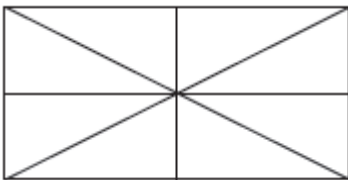
5) There are 28 books in a box. Given that $\frac{4}{7}$ of them are for Mathematics, and the remaining are English. Find the number of Mathematics books and English books.

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: ~~THE RELATIONSHIP BETWEEN~~ 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 whole number.

5.3 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 Generic competences to be developed

Cooperation: developed when pupils work collaboratively in group to develop interpersonal relations and life skills;

Communication: developed when pupils discuss either in groups or in the whole class, present findings, debate etc.

Creativity and innovation: developed when pupils make number cards, apply skills in solving real life problems, etc.

Problem solving: when pupils use acquired skills to solve problems from their real life situation.

Lifelong learning: when the learner is engaged in activities showing her/him to have the need for more learning with a curiosity of applying the knowledge learnt in a range of situations.

5.5 Unit key vocabularies or concepts

Some of the standard instruments used to measure length are a ruler, meter scale, measuring tape, vernier caliper, and screw gauge.



Folding meter: meter scale for a carpenter

Measuring tape: a tape frequently used by taylor's.

Decameter: a unit of length measurement equaling to 10 meters.

Standard unit: It is a unit of measurement used internationally where other units are converted to.

The standard unit of length measurement is the meter(m).

5.6 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 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 facilitate 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.

5.7 Guidance on how to help learners with special education needs

- Provide to slow learners simple activities found in this book;

- Identify the level of physical impairment for some learners and facilitate them with appropriate learning resources;
- Identify talented pupils and give them more complex activities to retain them in learning without disturbing other classmates.

5.8 Sub-headings /List of lessons

UNIT 5: LENGTH MEASUREMENTS			16 Periods
	Lesson title	Learning objectives	Number of periods
1	Introductory activity	Arouse the curiosity of learners on the importance of measuring, reading and writing length measurements.	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
4	Comparing length measurements	Compare length measurements.	2
5	Arranging objects according to their lengths	Arrange objects according to their lengths.	2
6	Addition of length measurements	Add of length measurements.	2
7	Subtraction of length measurements	Subtract of length measurements.	1
8	Multiplying length measurements by a whole number	Multiply length measurements by a whole number.	1
9	Dividing length measurement by a whole number	Divide length measurement by a whole number.	1
10	Word problems involving length measurements	Solve word problems involving length measurements.	2
	End unit assessment	Measure and show the relationship between length measurements, compare, add, subtract length measurements and multiply/ divide length measurements by a whole number.	1

5.9 Teaching and learning activities

5.9.1 Lesson 1: Measuring the length of objects

a) Objectives

Knowledge:

Understanding the meaning of length of an object.

Skills:

Use instruments of length measurement and measure the length of objects.

Values

- Measure quickly and accurately;
- Develop the culture of kindness when measuring the length of different objects.
- Appreciate the importance of length measurements in real life.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:

Work out different activities for using a meter ruler to measure length of objects and distances.

c) Teaching resources and learning resources

- Different instruments of measuring the length: meter or centimeter rulers, folding meter, 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.

d) Teaching and learning activities:

- Invite pupils to observe learning materials and explain instructions on activities to be done (use activity 5.1.1);
- 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 the activity 5.1.2, activity 5.1.3, 5.1.4 and activity 5.1.6 for discussion
- Ask some groups to present the findings and guide the whole class to harmonize how to measure the length and different instruments to be used.

e) Synthesis/summarization

Guide pupils to summarize how to measure the length and different instruments to be used.

f) Assessment

Provide activities to pupils from the pupil's book (application activity 5.1).

5.9.2 Lesson 2: Relationship between length measurements and their conversion

a) Objectives

Knowledge:

Understanding the relationship between length measurements and their conversion.

Skills:

Draw a table of conversion and convert length measurements

Values

- Measure quickly and accurately;
- Develop the culture of kindness when measuring the length of different objects.
- Appreciate the importance of length measurements in real life.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:
 - Work out different activities for converting length measurement expressed in m, dm and cm.
 - Organize learning materials to be used by pupils.

c) Teaching resources and learning resources

- Different instruments of measuring the length: meter or centimeter rulers, folding meter, 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.

d) Teaching and learning activities:

- 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;
- Organize groups of pupils and give them activities to do (for example Activity 5.2, and 5.3.1, 5.3.2).
- 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 convert the units of length measurements. .

e) 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.

f) Assessment

- Provide activities to be done by pupils (see self assessment 5.3 and application activity 5.3) and check their answers.
- Assign all pupils a homework.

g) Answer for activities

Answers for pair assessment 5.3

- a) 8 km = 80 hm c) 2hm = 20dam
b) 7 km = 700 dam d) 4 hm = 400 m

Answers for self assessment 5.3

- a) 90 hm = 9 km c) 60dam = 6 hm
b) 800 dam = 8km d) 500m = 5hm

Answers for application activity 5.3

- a) 450 m = 45dam e) 4 300 dm = 430m h) 4dm 7mm = 407mm
b) 13hm = 1300m f) 234m = 2340dm i) 6m 7dm = 68dm
c) 56dam = 5 600dm g) 8km 7m = 8007m j) 9dam 4cm = 9004cm .
d) 3 500 mm = 35dm

5.9.3 Lesson 3: Comparing length measurements

a) Objectives

Knowledge:

Understand how to compare units of length measurement and to compare lengths of objects.

Skills:

Measure and compare lengths of objects using standard units

Values

- Measure quickly and accurately;
- Develop the culture of kindness when measuring the length of different objects.
- Appreciate the importance of length measurements in real life.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Organize learning materials to be used by pupils.

- Guide pupils to: Work out different activities for comparing the lengths of different objects using m, dm and cm.

c) Teaching resources and learning resources

- Different instruments of measuring the length: meter or centimeter rulers, folding meter, 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.

d) Teaching and learning activities:

- Show pupils objects of different lengths and ask them to compare the lengths of them before measuring where they say the highest and the shortest (refer to activity 5.5.1);
- Invite one pupil in front of others and guide him/her on how to measure and record lengths of objects using a meter ruler and then compare the obtained measurements using $<$, $>$ or $=$;
- Organize groups of pupils and give them activities to do (for example Activity 5.4, activity 5.5.2 and activity 5.5.3);
- 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 lengths of objects.

e) 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.*

f) Assessment

- Provide activities to be done by pupils (use the application activity 5.6) and check their answers;
- Assign all pupils a homework to do.

g) Answer for activities

Answers for activity 5.4

It is better to convert in the smallest unit before comparing.

- a) $234\text{ m} > 23\text{ hm}$ c) $49\text{dm} < 9\text{ m}$ e) $256\text{cm} > 25\text{ dm}$
b) $3\text{km} = 300\text{dam}$ d) $87\text{dm} = \text{cm } 870$ f) $57\text{mm} > 5\text{cm}$

Answers for application activity 5.6

If you have compound unit, convert first in the smallest unit and compare:

- 1) a) $3\text{km } 5\text{m} = 30\text{hm } 5\text{m}$ c) $\text{dm } 575 > \text{m } 57$
b) $407\text{m} = 4\text{hm } 7\text{m}$ d) $49\text{dam} < 9\text{hm}$

2) 45 km: 9km = 5 times.

Answers for pair assessment 4.3

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 5.7.1** and **activity 5.7.2**.

Answers for activity 5.7.1

- | | |
|------------------------|-----------------------|
| 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. |

Answers for activity 5.7.2

- | | |
|-----------------------|----------------------|
| a) 9hm, 785m, 54dam | d) 8km, 56hm, 237dam |
| b) 76hm, 79dam, 247m, | e) 92m, 8dam , 797dm |
| c) 49dm, 39cm, 91mm, | f) 9km, 59dam, 48hm. |

Answers for application activity 5.7

- | | |
|------------------------------|---------------------------|
| 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. |

5.9.4 Lesson 4: Addition of length measurements

a) Objectives

Knowledge:

Understand the meaning of the sum of length measurements.

Skills:

- Use conversion tables to convert from one unit of length to another before adding them;
- Demonstrate addition of lengths using number sentences in the conventional manner.

Values

- Measure quickly and accurately;
- Develop the culture of kindness when measuring the length of different objects.
- Appreciate the importance of length measurements in real life.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:
 - Work out different activities for adding the lengths of different objects using m, dm and cm.

- Organize learning materials to be used by pupils.

c) Teaching resources and learning resources

- Different instruments of measuring the length: meter or centimeter rulers, folding meter, 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.

d) Teaching and learning activities:

- Invite one pupil in front of others and guide him/her on how to demonstrate addition length measurements starting by using a conversion table to convert in the smallest unit or in the requested unit, and then add them using standard written method;
- Organize groups of pupils and give them activities to do (for example Activity 5.8);
- 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 length measurements;

e) 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.**

f) Assessment

- Provide activities to be done by pupils (pair assessment 5.8 and self assessment 5.8) and check their answers.
- Assign homework to be done by all pupils.

g) Answer for activities

Answers for activity 4.5.1

- a) $9 \text{ km} + 789 \text{ m} = 9 \text{ 789 m}$
- b) $56 \text{ hm} + 238 \text{ m} = 5 \text{ 838 m}$
- c) $475 \text{ dam} + 250 \text{ m} = 5\text{km}$

- d) $5 \text{ m} + 500 \text{ cm} = 1 \text{ dam}$
- e) $375 \text{ dm} + 2 \text{ m } 5 \text{ dm} = 4 \text{ dam}$
- f) $35 \text{ cm} + 9 \text{ m} = 935\text{cm}$

Answers for pair assessment 5.8

- a) $145 \text{ dam} + 2 \text{ 855 m} = 3\text{km}$
- b) $39 \text{ hm} + 610 \text{ dam} = 10\text{km}$
- c) $74 \text{ hm} + 260 \text{ dam} = 10\text{km}$

- d) $76 \text{ dam} + 240 \text{ m} = 1\text{hm}$
- e) $63 \text{ dm} + 37 \text{ cm} = 667\text{cm}$
- f) $27 \text{ cm} + 6 \text{ m} = 6270\text{mm}$

Answers for self assessment 5.8

- a) $47 \text{ hm} + 930 \text{ dam} = 14\text{km}$
- b) $3 \text{ m } 8\text{cm} + 25\text{dm} = 558\text{cm}$

c) $45\text{m} + 5\,500\text{cm} = 1\text{hm}$

Note:

Concerning **the lesson on word problems involving addition of length measurements**, the teacher will help pupils to solve a one –step or a two-step problem:

- Guide them to *understand the problem*,
- *identify facts (givens and requests)*,
- *draw visual representations and solve the problem using the addition.*

Start by guiding pupils to solve some problems in groups or in a whole class discussion (use activity 5.9), provide problems to be solved into groups or in pairs (**pair assessment 5.9**) and then give problems to be solved individually (**self assessment 5.9**).

Answers for pair assessment 5.9

- 1) Number of km he covered altogether: $359\text{km} + 4360\text{hm} + 405\text{km} = 1200\text{km}$
- 2) Number of meters of fabric they have altogether: $175\text{m} + 1250\text{dm} = 300\text{m}$
- 3) The length of both ropes: $150\text{m} + 2500\text{dm} = 400\text{m}$.

Answers for self assessment 5.9

- 1) Number of hm he covered from his home to the market : $900\text{m} + 11\text{hm} = 20\text{hm}$
- 2) Number of hm they covered altogether: $21\text{km} + 1200\text{dam} = 330\text{hm}$

Answers for application activity 5.9

- 1) The length of the road from Kigali to Rusizi: $125\text{km} + 1670\text{hm} = 292\text{km}$
- 2) The length of both gardens: $95\text{m} + 105\text{m} = 200\text{m}$.

4.9.5 Lesson 5: Subtraction of length measurements

a) Objectives

Knowledge:

Understand the meaning of the difference of length measurements.

Skills:

- Use conversion tables to convert from one unit of length to another before subtraction;
- Demonstrate subtraction of lengths using number sentences in the conventional manner.

Values

- Measure quickly and accurately;
- Develop the culture of kindness when measuring the length of different objects.
- Appreciate the importance of length measurements in real life.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Organize learning materials to be used by pupils.
- Guide pupils to: Work out different activities for subtracting the lengths of different objects using m, dm and cm.

c) Teaching resources and learning resources

- Different instruments of measuring the length: meter or centimeter rulers, folding meter, 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.

d) Teaching and learning activities:

- Invite one pupil in front of others and guide him/her on how to demonstrate subtraction of length measurements starting by using a conversion table to convert in the smallest unit or in the requested unit, and then subtract using standard written method;
- Organize groups of pupils and give them activities to do (for example Activity 5.10);
- 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 length measurements;

e) 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;

f) Assessment

- Provide activities to be done by pupils (pair assessment 5.10 and self assessment 5.10) and check their answers.
- Assign homework to be done by all pupils.

g) Answer for activities

Answers for activity 5.10

- | | |
|--|--|
| a) $5 \text{ hm} - 298 \text{ m} = 202\text{m}$ | d) $75\text{cm} - 579\text{mm} = 171\text{mm}$ |
| b) $9 \text{ km} - 832 \text{ dam} = 68\text{dam}$ | e) $753\text{dam} - 69\text{hm} = 630\text{m}$ |
| c) $74\text{dm} - 490\text{cm} = 250\text{dm}$ | f) $835\text{dm} - 7 \text{ dam} = 135\text{dm}$ |

Answers for pair assessment 5.10

- | | |
|--|--|
| a) $5\text{km} - 28 \text{ hm} = 220\text{dam}$ | d) $\text{dam} 415 - 3\text{km} = 1150\text{m}$ |
| b) $9\text{hm} - 73\text{dam} = 170\text{m}$ | e) $64\text{dam} - 440 \text{ m} = 2 \text{ hm}$ |
| c) $724\text{cm} - 62 \text{ dm} = 104\text{cm}$ | f) $36\text{m} - 973\text{cm} = 2627\text{cm}$ |

Note:

Concerning **the lesson on word problems involving addition of length measurements**, the teacher will help pupils to solve a one –step or a two-step problem:

- Guide them to *understand the problem*,
- *identify facts (givens and requests)*,
- *draw visual representations and solve the problem using the addition.*

Start by guiding pupils to solve some problems in groups or in a whole class discussion (use **activity 5.11**), provide problems to be solved into groups or in pairs (**pair assessment 5.11**) and then give problems to be solved individually (**self assessment 5.11**).

Answers for pair assessment 5.11

- 1) Number of km remained to complete the race: $42 \text{ km} - 2900 \text{ dam} = 13 \text{ km}$
- 2) Number of km were left to be completed: $987 \text{ dam} - 5870 \text{ m} = 4 \text{ km}$

Answers for self assessment 4.8

- 1) Number of meters she remained with: $175 \text{ m} - 9 \text{ dam} = 85 \text{ m}$
- 2) Muhizi is taller than Kaneza, their difference in height is : $186 \text{ cm} - 169 \text{ cm} = 17 \text{ cm}$

Answers for application activity 5.11

- 1) Number of meters he remained with: $12 \text{ dam} - 20 \text{ m} = 100 \text{ m}$
- 2) Ishimwe jumped long length. The difference is: $3 \text{ m} - 21 \text{ dm} = 50 \text{ cm}$.

4.9.6 Lesson 6: Multiplication of length measurements by a whole number

a) Objectives

Knowledge:

Understand the meaning of the multiplication of **length measurements by a one digit number**

Skills:

- Demonstrate the multiplication of a length by a whole number as a repeated addition;
- Calculate the product of **length measurements by a one digit number** using

A standard written method

Values

- Develop the capacity of quick critical thinking to find the product of length measurement by a whole number.
- Develop the culture of kindness when measuring the length of different objects.
- Appreciate the importance of length measurements in real life.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;

➤ Guide pupils to:

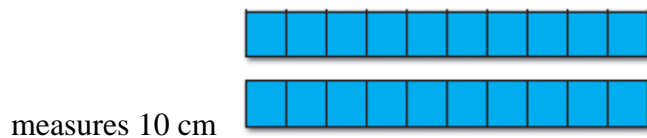
- Multiply a 3 digit number by one digit number;
- Use concrete objects such as 5 sticks of the same length for example 1m and show that the multiplication of 1m by 5 is the length of 5 sticks put on the same line one at the extremity of another.

c) Teaching resources and learning resources

- Different instruments of measuring the length: meter or centimeter rulers, folding meter, 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.

d) Teaching and learning activities:

- Invite one pupil in front of others and guide him/her on how to demonstrate the multiplication of length measurement by a number using concrete materials: two sticks where each one



- Ask other pupils to say the total length for them when they are put on the same line one by another, then they will see that it is equal two 10cm x 2.
- Organize groups of pupils and give them activities to do (for example Activity 5.12);
- 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 length measurement by a number.

e) 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.**

f) Assessment

- Provide activities to be done by pupils (application activity 5.12) and check their answers.
- Assign homework to all pupils.

g) Answer for activities

Answer for activity 5.12

- a) $203\text{cm} \times 3 = 609\text{cm}$ c) $5\text{hm } 4\text{dam} \times 2 = 1\ 080\text{ m}$
 b) $42\text{ dam} \times 5 = 21\text{hm}$ d) $81\text{ m} \times 5 = 4\ 050\text{ dm}$

Answer for application activity 5.12

- a) $375\text{ m} \times 2 = \text{dam}75$ d) $4\text{dam } 8\text{m} \times 5 = 24\text{ dam}$
 b) $72\text{m } 3\text{dm} \times 3 = 2169\text{dm}$ e) $4\text{m } 2\text{cm} \times 6 = 2\ 412\text{ cm}$
 c) $45\text{hm} \times 4 = 18\text{km}$ f) $215\text{dm} \times 8 = 172\text{ m}$

Note

Concerning **the lesson on word problems involving multiplication of length measurements by a number**, the teacher will help pupils to solve a one –step or a two-step problem:

- guide them to *understand the problem*,
- *identify facts (givens and requests)*,
- *draw visual representations and solve the problem using the addition.*

Start by guiding pupils to solve some problems in groups or in a whole class discussion (use **activity 5.13**), provide problems to be solved into groups or in pairs (**pair assessment 5.13**) and then give problems to be solved individually (**self assessment 5.13 and application activity 5.13**).

Answer for pair assessment 5.13

- 1) The length of 6 pieces of cloth: $50\text{ m} \times 6 = 300\text{ m}$
 2) Number of meter of electric wire did they have altogether: $30 \times 3 = 90\text{ m}$

Answer for self assessment 5.13

- 1) The length of a flat: $4\text{ m} \times 8 = 32\text{ m}$
 2) The length of the new made big piece of thread: $100\text{ m} \times 9 = 900\text{ m}$

Answer for application activity 5.13

- 1) The total length of that a piece of cloth: $9\text{dam} \times 6 = 54\text{dam} = 540\text{m}$
 2) Number of dam he bought altogether: $5\text{ m} \times 8 = 40\text{ m} = 4\text{ dam}$.

5.9.7 Dividing a length measurement by a whole number

a) Objectives

Knowledge:

Understand the meaning of the division of **length measurement by a one digit number**.

Skills:

- Demonstrate the division of a length by a whole number as a grouping of equal parts from an initial length.
- Calculate the quotient of a **length measurement by a one digit number** using a standard written method.

Values

- Develop the capacity of quick critical thinking to find the product of length measurement by a whole number.
- Develop the culture of kindness when measuring the length of different objects.
- Appreciate the importance of length measurements in real life.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:
 - Divide a 3 digit number by one digit number;
 - Use a concrete object such as a long stick of 6m to be cut in 3 equal parts of the same length and show that division of 6m by 3 is the length of 1 part.

c) Teaching resources and learning resources

- Different instruments of measuring the length: meter or centimeter rulers, folding meter, 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.

d) Teaching and learning activities:

- Invite one pupil in front of others and guide him/her on how to demonstrate the division a length measurement in a given number of parts: long stick of 6cm to be cut in 3 equal parts of the same length:



- Ask other pupils to say the length for each part: they will see that it is equal to $3 \text{ cm} = 6 \text{ cm} : 2$.
- Organize groups of pupils and give them activities to do (for example Activity 5.14.1 and activity 5.14.2);
- 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 length by a whole number;

e) Synthesis/summarization

Guide pupils to summarize how to divide a length by a whole 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.

f) Assessment

- Provide activities to be done by pupils and check their answers.
- Assign homework to all pupils.

g) Answer for activities

Answer for activity 5.14.1

- | | |
|------------------------|------------------------|
| a) 580 dm: 5 = 1160 cm | d) 480 cm: 8 = 6 dm |
| b) 2400 dam: 6 = 4km | e) 1200 m : 3 = 4 hm |
| c) 5400 mm: 9 = 6 dm | f) 2000 dm : 4 = 5 dam |

Answer for activity 5.14.2

- | | |
|------------------------|--------------------------|
| a) 248 hm : 8 = 3100 m | d) 680 cm : 4 = 17 dm |
| b) 485 dam : 5 = 970 m | e) 650 dm : 5 = 13 m |
| c) 2800 m : 7 = 4 hm | f) 960 cm : 3 = 3 200 mm |

Note

Concerning **the lesson on word problems involving the division of length measurements by a whole number**, the teacher will help pupils to solve a one –step or a two-step problem:

- guide them to *understand the problem*,
- *identify facts (givens and requests)*,
- *draw visual representations and solve the problem using the addition.*

Start by guiding pupils to solve some problems in groups or in a whole class discussion (use **activity 5.15**), provide problems to be solved into groups or in pairs (**pair assessment 5.15**) and then give problems to be solved individually (**self assessment 5.15 and application activity 5.15**).

Answer for pair assessment 5.15

- 1) Number of dam of electric wire each got: $240 \text{ m} : 6 = 40 \text{ m} = 4 \text{ dam}$
- 2) Number of cm of sugarcane each got: $18 \text{ dm} : 9 = 20 \text{ cm}$.

Answer for self assessment 5.15

- 1) The length of each floor: $50 \text{ m} : 10 = 5 \text{ m}$.
- 2) The length of each one's task: $8 \text{ hm} : 8 = 1 \text{ hm} = 100\text{m}$.

Answer for application activity 5.15

The length of each small piece of cloth: $49 \text{ m} : 7 = 70\text{dm}$.

5.10 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.

c) 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) $4 \text{ hm } 8\text{dm} = 4 \text{ 008 dm}$
c) $7\text{m } 8\text{mm} = 7 \text{ 008 mm}$ f) $4 \text{ 500 m} = 45\text{hm}$
- 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) $590\text{m} : 5 = 1180 \text{ dm}$ d) $6 \text{ 400 dm} : 8 = 8\text{dm}$
- 6) a) 750dm b) 12dam c) $108\text{m} + 56\text{m} = 164\text{m}$
d) 108m e) **Kamana ran** : $108 \text{ m} + 56 \text{ m} + 64 \text{ m} + 108 \text{ m} + 125 \text{ m} + 75 \text{ m} = 536 \text{ m}$.
- 7) a) Kagabo 9759m c) Jabo , Gatari, Kamazi, Kagabo
b) Jabo 8000m d) Kagabo, Kamazi, Gatari, Jabo

8) Number of meters left for completing the target: $50 \text{ km} - 487 \text{ dam} = 5130 \text{ m}$.

9) Peter un: $500 \text{ m} \times 6 = 3000 \text{ m} = 3 \text{ km}$.

10) The length for every rope: $36 \text{ m} : 9 = 4 \text{ m} = 400 \text{ cm}$.

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

$4 \text{ hm}, 67 \text{ m}, 8 \text{ km}, 37 \text{ dam}$.

3) Arrange from the the biggest to smallest

$9 \text{ m}, 456 \text{ mm}, 18 \text{ dm}, 789 \text{ cm}$

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) Solve

a) Keza walks 5 km from home to the market. If she goes and then comes back, how many kilometers does she cover?

b) Musoni went from home to the head quarter of the province distant to 150 km . After waking 900 hm , she gets tired and passes the night there. How long is the 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 4 m sugar cane 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) $\text{dm } 38 \text{ mm } 97 = \dots \text{ mm}$

2) Arrange from the smallest to the biggest

$975 \text{ dam}, 8 \text{ km}, 79 \text{ hm}, 9875 \text{ m}$.

3) Arrange from the the biggest to smallest

8765 mm, 97 dm, 9m, 786 cm.

4) Use $>$, $<$ or $=$ to compare:

a) 4 hm 9dm ... 49dam

b) 897 m 6 dm... 85dam 7m

c) 75dm 9mm 750cm 9mm

5) Work out:

a) $4\ 560\ \text{mm} + 544\text{cm} = \dots\text{dm}$

c) $789\text{dam} \times 9 = \dots\text{dam}$

b) $9\ 780\ \text{dm} - 898\text{m} = \dots\text{dam}$

d) $9\ 882\ \text{km} : 9 = \dots\ \text{k}$

6) Solve these problems

a) On Monday a traveler made a journey of 75km, on Tuesday 870hm and 9600dam on Wednesday. How many kilometers did the traveler in those 3 days?

b) Kagisha participated in a race competition on a 42km of distance. However, he got tired and stop the competition before running 2 900m until the end. How many kilometers 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?

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.

6.3 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 Generic competences to be developed

Cooperation: developed when pupils work collaboratively in group to develop interpersonal relations and life skills;

Communication: developed when pupils discuss either in groups or in the whole class, present findings, debate etc.

Creativity and innovation: developed when pupils make number cards, apply skills in solving real life problems, etc.

Problem solving: when pupils use acquired skills to solve problems from their real life situation.

Lifelong learning: when the learner is engaged in activities showing her/him to have the need for more learning with a curiosity of applying the knowledge learnt in a range of situations.

6.5 Unit key vocabularies 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 balance that meets standards.

Non standard mass : the mass that is not correct because the balance used does not meet

standards or because one who measured the quantity did wrongly.

Balance with standard measurements: Balance that satisfies the guidelines for the production of uniform, interchangeable components, especially for use in mass production.

6.6 Guidance on introductory activity 6

- Invite pupils to read the story of Sano who does not know 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 facilitate 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.

6.7 Guidance on how to help learners with special education needs

- Provide to slow learners simple activities found in this book;
- Identify the level of physical impairment for some learners and facilitate them with appropriate learning resources;
- Identify talented pupils and give them more complex activities to retain them in learning without disturbing other classmates.

6.8 Sub-headings/List of lessons

UNIT 6: MASS MEASUREMENTS FROM KILOGRAM TO GRAM			16 periods
	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	Measure, read and write the mass	1

	objects	of objects.	
3	Relationship between mass measurements and their conversion	Show relationship between mass measurements and their conversion.	2
4	Comparing mass measurements	Compare mass measurements.	2
5	Arranging objects according to their mass	Arrange objects according to their mass .	2
6	Addition of mass measurements	Add mass measurements.	2
7	Subtraction of mass measurements	Subtract mass measurements.	2
8	Multiplying mass measurements by a whole number	Multiply mass measurements by a whole number.	1
9	Dividing mass measurement by a whole number	Divide mass measurement by a whole number.	1
10	Word problems involving mass measurements	Solve word problems involving mass measurements.	1
	End unit assessment	Measure and compare the weight of different objects within 10kg. Addition, subtraction, multiplication and division of mass measurements from kg up to g.	1

6.9 Teaching and learning activities

6.9.1 Lesson 1: Reading, writing and measuring the mass of objects

a) Objectives

Knowledge:

Understanding the meaning of mass of an object.

Skills:

- Read and write the mass of objects from the balance;
- Use instruments of mass measurement and measure the mass of objects.

Values

- Measure quickly and accurately;
- Develop the culture of kindness when measuring the mass of different objects.
- Appreciate the importance of mass measurements in real life.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:

Work out different activities for using a balance to measure mass or weight of objects.

c) 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.

d) Teaching and learning activities:

- Invite pupils to observe learning materials and explain instructions on activities to be done (use activity 6.1.1);
- 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 the activity 6.1.2, activity 6.1.3, 6.1.4 for discussion;
- Ask some groups to present the findings and guide the whole class to harmonize how to measure the mass and how to read and write them correctly.

e) Synthesis/summarization

Guide pupils to summarize how to measure the mass and how to read and write them correctly.

f) Assessment

Provide activities to pupils from the pupil's book.

6.9.2 Lesson 2: Relationship between mass measurements and their conversion

a) Objectives

Knowledge:

Understanding the relationship between mass measurements and their conversion.

Skills:

Draw a table of conversion and convert mass measurements

Values

- Measure quickly and accurately;
- Develop the culture of kindness when measuring the mass of different objects.
- Appreciate the importance of mass measurements in real life.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:

- Work out different activities for reading and adding mass measurement expressed in kg.
- Organize learning materials to be used by pupils.

c) 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.

d) 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;
- Organize groups of pupils and give them activities to do (for example Activity 6.2, and 6.3.1, 6.3.2, 6.4.1, and 6.4.2).
- 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 convert the units of mass measurements.

e) Synthesis/summarization

Guide pupils to summarize the relationship between mass 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.

f) Assessment

- Provide activities to be done by pupils (see application activity 6.4) and check their answers.
- Assign all pupils a homework to be done.

g) Answer for activities

Answers for application activity 6.3

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**

- a) It is good to buy non weighted items/objects : **False**
- b) Kilogram (kg) is the standard unit of mass measurements: **True**
- c) Gram (g) is the most unit used in mass measurements: **False**

6.9.3 Lesson 3: Comparing mass measurements

a) Objectives

Knowledge:

Understand how to compare units of mass measurement and to compare mass of objects.

Skills:

Measure and compare masses of objects using standard units

Values

- Measure quickly and accurately;
- Develop the culture of kindness when measuring the mass of different objects.
- Appreciate the importance of mass measurements in real life.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:
 - Work out different activities for comparing the mass of different objects.
- Organize learning materials to be used by pupils.

c) 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.

d) 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 6.5.1);
- 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 6.5.4, activity 6.5.5 and activity 6.5.7);
- 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 weights of objects.

e) Synthesis/summarization

- Guide pupils to summarize how to compare lweights of objects: *use a conversion table to convert all masses in the smallest unit given and then to compare obtained values.*

f) Assessment

- Provide activities to be done by pupils (use the application activity 6.5) and check their answers;
- Assign all pupils a homework to do.

g) Answer for activities

Answers for activity 6.5.7

- a) $2\text{kg} < 203\text{dag}$ c) $89\text{dag} > 8\text{kg}$ e) $5\text{kg} \ 7\text{dag} < 75\text{hg}$
b) $67\text{hg} = 670\text{g}$ d) $908\text{g} = 9\text{hg} \ 8\text{g}$ f) $135\text{dag} > 12\text{hg}$

Answers for application activity 6.5

- a) $6\text{kg} \ 9\text{g} < 69\text{hg}$ c) $7\text{dag} \ 9\text{g} < 9\text{h} \ 7\text{g}$ e) $8\text{kg} \ 6\text{dag} = 86\text{hg}$
b) $78\text{hg} > 87\text{dag}$ d) $479\text{g} > 4\text{hg} \ 9\text{g}$ f) $12\text{hg} < 129\text{dag}$

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 to do the **activity 6.6.1 and activity 6.6.2.**

Answers for activity 6.6.1

- a) 530 g, 45 dag, 79 hg
- b) 52hg, 549dag, 52hg, 9kg
- c) 310g, 79dag, 48hg.
- d) 4kg, 576dag, 76hg
- e) 345dag, 56hg, 8kg
- f) 271g, 54dag, 9kg.

Answers for activity 6.6.2

- a) 7kg, 65hg, 791g
- b) 4kg, 869g, 24dag
- c) 9kg, 68hg, 153dag
- d) 245hg, 5kg, 64dag.

Answers for application activity 6.6

1. a) 184g, 54dag, 6hg
 - b) 45dag, 27hg, 9kg
 - c) 58g, 7hg, 87dag
 - d) 97g, 96dag, 6kg.
2. a) 57hg, 5kg, 897 g
 - b) 18hg, 29dag, 47g
 - c) 7kg, 48dag, 38g
 - d) 68hg, 164dag, 91g.

6.9.4 Lesson 4: Addition of mass measurements

a) Objectives

Knowledge:

Understand the meaning of the sum of mass measurements.

Skills:

- Use conversion tables to convert from one unit of mass to another before adding them;
- Demonstrate addition of masses using number sentences in the conventional manner.

Values

- Measure quickly and accurately;
- Develop the culture of kindness when measuring the mass of different objects.
- Appreciate the importance of mass measurements in real life.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:
 - Work out different activities for adding the mass of different objects using kg.
 - Estimate the weight of familiar objects by comparing two objects and guessing which one is 'heavier' or 'lighter'
 - recognize that a larger object can be lighter and a smaller object can be heavier.
 - read the labels on products which show their mass (weight) and comparing the mass (weight) of various objects by putting them in order.
- Organize learning materials to be used by pupils.

c) Teaching resources and learning resources

- Balances of measuring the mass;
- Objects of different weights to be measured and compared, .
- Gridded paper, diagrams or pictures of exact measurements.
- Conversion table of length measurements.

d) 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;
- Organize groups of pupils and give them activities to do (for example Activity 6.7);
- 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;

e) 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.**

f) Assessment

- Provide activities to be done by pupils (pair assessment 6.8 and self assessment 6.8) and check their answers.
- Assign homework to be done by all pupils.

g) Answer for activities

Answers for activity 6.7

- a) $130 \text{ dag} + 7 \text{ hg} = 2 \text{ kg}$
- b) $56 \text{ hg} + 40 \text{ dag} = 6 \text{ kg}$
- c) $85 \text{ dag} + 7 \text{ g} = 80 \text{ hg}$
- d) $7 \text{ kg} + 3 \text{ hg} = 730 \text{ dag}$

Answers for application activity 6.7

- a) $52 \text{ g} + 75 \text{ dag} = 802 \text{ g}$
- b) $78 \text{ dag} + 220 \text{ g} = 1 \text{ kg}$
- c) $6 \text{ kg} + 24 \text{ dag} = 624 \text{ dag}$
- d) $195 \text{ dag} + 50 \text{ g} = 2 \text{ kg}$
- e) $73 \text{ dag} + 270 \text{ g} = 10 \text{ kg}$

f) $75 \text{ hg} + 105 \text{ dag} = 855 \text{ dag}$

Note:

Concerning **the lesson on word problems involving addition of length measurements**, the teacher will help pupils to solve a one –step or a two-step problem:

Start by guiding pupils to solve some problems in groups or in a whole class discussion (use activity 6.8), provide problems to be solved into groups or in pairs (**pair assessment 6.8**) and then give problems to be solved individually (**self assessment 6.8**).

Answers for pair assessment 6.8

1) Number of kg of mixture for flours he got: $56 \text{ kg} + 195 \text{ kg} + 189 \text{ kg} + 205 \text{ kg} = 645 \text{ kg}$

2) Number of kg he harvested in those two seasons: $987 \text{ hg} + 9130 \text{ dag} = 190\text{kg}$

Answers for self assessment 6.8

1) Number of kg he sold during those two days: $975 \text{ dag} + 9250 \text{ g} = 19 \text{ kg}$

2) Number of kg of ground nuts they bought altogether: $375\text{kg} + 2250\text{hg} = 600\text{kg}$

Answers for application activity 6.8

1) The weight in kg of all products bought:

$$1000 \text{ hg} + 50 \text{ kg} + 50\text{kg} + 50\text{kg} + 7500\text{dag} = 325\text{kg}.$$

2) The weight in kg of all products bought:

$$500\text{g} + 10 \text{ hg} + 50 \text{ dag} + 2\text{kg} + 300\text{dag} + 10\text{hg} = 8 \text{ kg}.$$

6.9.5 Lesson 5: Subtraction of mass measurements

a) Objectives

Knowledge:

Understand the meaning of the difference of **mass** measurements.

Skills:

- Use conversion tables to convert from one unit of **mass** to another before subtraction;
- Demonstrate subtraction of **mass** using number sentences in the conventional manner.

Values

- Measure quickly and accurately;
- Develop the culture of kindness when measuring the **mass** of different objects.
- Appreciate the importance of **mass** measurements in real life.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:

- Work out different activities for subtracting the **mass** of different objects.
- Organize learning materials to be used by pupils.

c) Teaching resources and learning resources

- Different instruments of measuring the **mass**;
- Objects of different **mass or weights** to be measured and compared;
- Conversion table of **mass** measurements.

d) 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;
- Organize groups of pupils and give them activities to do (for example Activity 6.9);
- 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.

e) 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;

f) Assessment

- Provide activities to be done by pupils (application activity 6.9 and check their answers.
- Assign homework to be done by all pupils.

g) Answer for activities

Answers for activity 6.9

- a) 51g c) 8 850g e) 1 080g g) 400 g
 b) 186dag d) 43 hg f) 17dag h) 822dag.

Answers for application activity 6.9

- a) $825 \text{ dag} - 250 \text{ g} = 8 \text{ kg}$
 b) $972 \text{ dag} - 9 \text{ kg} = 72 \text{ dag}$
 c) $760 \text{ g} - 5 \text{ hg} = 26 \text{ dag}$
 d) $673 \text{ dag} - 47 \text{ hg} = 203 \text{ kg}$.

Note:

Concerning **the lesson on word problems involving subtraction mass measurements**, the teacher will help pupils to solve a one –step or a two-step problem:

Start by guiding pupils to solve some problems in groups or in a whole class discussion (use **activity 6.10**), provide problems to be solved into groups or in pairs (**pair assessment 6.10**) and then give problems to be solved individually (**self assessment 10**).

Answers for pair assessment 6.10

- 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: $50\text{kg} - 1200\text{dag} = 380\text{hg}$.

Answers for self assessment 6.10

- 1) The weight of Mugeni: $39 \text{ kg} - 6 \text{ kg} = 33\text{kg}$
- 2) The number of kg she lost: $98\text{kg} - 65 \text{ kg} = 33\text{kg}$.

Answers for application activity 6.10

- 1) Number of kg she remained with: $100 \text{ kg} - (380\text{hg} + 4 \text{ 500dag}) = 17\text{kg}$.
- 2) The number of kg of sugar he remained with: $8 \text{ 000 hg} - 5 \text{ 000 dag} = 30\text{kg}$.

6.9.6 Lesson 6: Multiplication of mass measurements by a whole number

a) Objectives

Knowledge:

Understand the meaning of the multiplication of **mass measurements by a one digit number**

Skills:

- Demonstrate the multiplication of a **mass(weight)** by a whole number as a repeated addition;
- Calculate the product of **mass measurements by a one digit number** using
A standard written method.

Values

- Develop the capacity of quick critical thinking to find the product of **mass** measurement by a whole number.
- Develop the culture of kindness when measuring the **mass** of different objects.
- Appreciate the importance of **mass** measurements in real life.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:
- Multiply a 3 digit number by one digit number;

- Use concrete objects such as 3 cups of water the same **mass** for example 1kg and show that the multiplication of 1kg by 3 is the mass of 3 cups of the same mass put together.

c) 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.

d) 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;
- 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 two $1\text{kg} \times 2 = 2\text{kg}$.
- Organize groups of pupils and give them activities to do (for example Activity 6.11);
- 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 mass measurement by a number.

e) 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.**

f) Assessment

- Provide activities to be done by pupils (Pair assessment 6.11) and check their answers.
- Assign homework to all pupils.

g) Answer for activities

Answer for activity 6.11

- | | | | |
|---------|----------|----------|----------|
| a) 55hg | c) 9hg | e) 87hg | g) 27dag |
| b) 1kg | d) 92dag | f) 2380g | h) 69dag |

Answer for pair assessment 6.11

- | | | | | |
|--------|--------|-------|--------|--------|
| a) dag | b) hg | c) kg | d) dag | e) dag |
| f) dag | g) dag | h) hg | i) kg | j) kg |

Note

Concerning **the lesson on word problems involving multiplication of mass measurements by a number**, the teacher will help pupils to solve a one –step or a two-step problem:

Start by guiding pupils to solve some problems in groups or in a whole class discussion (use **activity 6.12**), provide problems to be solved into groups or in pairs (**pair assessment 6.12**) and then give problems to be solved individually (**self assessment 6.12 and application activity 6.12**).

Answer for pair assessment 6.12

- 1) The weight of 9 similar packets: $500\text{g} \times 9 = 45\text{ hg}$.
- 2) Number of kg of rice we consume in 8 days: $500\text{g} \times 8 = 4\text{ kg}$.

Answer for self assessment 6.12

- 1) Number of kg of flour he bought if each packet weighs 5kg: $5\text{ kg} \times 8 = 40\text{kg}$.
- 2) Number of kg of rice did it grind in 4 days: $1\ 875\text{ kg} \times 4 = 7\ 500\text{kg}$.

Answer for application activity 6.12

- 1) The quantity of sugar processed in two days: $2\ 750\text{ kg} \times 2 = 5\ 500\text{ kg}$.
- 2) Number of kg of rice he harvested altogether: $100\text{kg} \times 9 = 900\text{kg}$.

6.9.7 Dividing a length measurement by a whole number

a) Objectives

Knowledge:

Understand the meaning of the division of **mass measurement by a one digit number**.

Skills:

- Demonstrate the division of mass by a whole number as a grouping of equal quantity from an initial weight.
- Calculate the quotient of a **mass measurement by a one digit number** using a standard written method.

Values

- Develop the capacity of quick critical thinking to find the quotient of mass measurement by a whole number.
- Develop the culture of kindness when measuring the mass of different objects.
- Appreciate the importance of mass measurements in real life.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:
 - Divide a 3 digit number by one digit number;

- Use a concrete object such as a bottle containing 5kg of water to be shared equally in 5 small bottles and then measure the mass for one small bottle.

c) 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.

d) Teaching and learning activities:

- Invite one pupil in front of others and guide him/her on how to demonstrate the division a mass measurement in a given number of quantities: bottle containing 5kg of water to be shared equally in 5 small bottles and measure the quantity for one bottle;
- Ask other pupils to say the mass for each quantity: they will see that it is equal to 5kg: $5 = 1 \text{kg}$;
- Organize groups of pupils and give them activities to do (for example Activity 6.13);
- 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;

e) Synthesis/summarization

Guide pupils to summarize how to divide a mass by a whole 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.

f) Assessment

- Provide activities to be done by pupils and check their answers.
- Assign homework to all pupils.

g) Answer for activities

Answer for activity 6.13

a) hg 210 = kg 21 b) hg 11 c) dag 31 d) g 1 100

Answer for application activity 6.13

a) kg b) g c) dag d) hg e) g f) hg

Note

Concerning **the lesson on word problems involving the division of mass measurements by a whole number**, the teacher will help pupils to solve a one –step or a two-step problem:

Start by guiding pupils to solve some problems in groups or in a whole class discussion (use **activity 6.14**), provide problems to be solved into groups or in pairs (**pair assessment 6.14**) and then give problems to be solved individually (**self assessment 6.14** and **application activity 6.14**).

Answer for pair assessment 6.14

- 1) The weight of each small sack: $75 \text{ kg} : 5 = 15\text{kg}$
- 2) The share of each: $200\text{kg} : 8 = 25\text{kg}$

Answer for self assessment 6.14

- 1) The share of each farmer: $9\ 600 \text{ dag} : 8 = 12\text{kg}$
- 2) The share of each member: $720\text{hg} : 9 = 8\text{kg}$
- 3) The weight of each packet in dag: $9\ 750\text{g} : 5 = 195\text{dag}$.
- 4) Number of kg each got: $240\text{hg} : 8 = 3\text{kg}$.

Answer for application activity 6.14

- 1) Number of g will you put on each tree seedlings: $840\text{g} : 7 = 120\text{g}$
- 2) The share of each sector: $4\ 000 \text{ hg} : 5 = 80\text{kg}$
- 3) Packets you will get: $8\ 000\text{g} : 8 = 1\ 000 \text{ g}$
- 4) The share of each person: $1\ 200 \text{ dag} : 6 = 2\text{kg}$

6.10 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; Use of non standard units and the use of 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) 825dag b) 569g c) 78hg d) $6\ 079\text{g}$.

- 2) a) $74\text{hg } 79\text{g} > 745\text{dag}$ b) $798\text{g} < 798\text{dag}$
 3) $487\text{g}, 48\text{hg}, 487\text{dag}$.
 4) a) $65\text{hg}, 6\text{kg } 8\text{g}, 56\text{dag } 8\text{g}$ b) $75\text{hg } 5\text{kg } 7\text{hg}, 627\text{dag}$
 5) a) 8kg b) 90hg c) 9dag .
 6) a) Number of kg he bought altogether:
 $750\text{hg} + 6\ 500\text{dag} + 60\text{kg} = 200\text{kg}$
 b) Number of hg he bought altogether: $\text{kg } 5 \times 7 = \text{hg } 350$
 c) Number of kg each got: $1\ 000\text{hg} : 4 = 25\text{kg}$.
 d) Number of kg he returned back at home if he had sold 6570g only:
 $857\text{dag} - 6\ 570\text{g} = 2\text{kg}$.

d. Remedial activities

- 1) Convert the following units:
 a) $5\text{kg } 8\text{g} = \dots\text{g}$ b) $8\text{hg } 7\text{dag} = \dots\text{g}$ c) $4\text{dag } 9\text{g} = \dots\text{g}$
 2) Arrange the following measurements in ascending order:
 $8\text{hg}, 97\text{g}, 5\text{kg}, 78\text{dag}$
 3) Arrange the following measurements in descending order:
 $99\text{g}, 56\text{dag}, 78\text{hg}, 9\text{kg}$.
 4) Use $>$, $<$ or $=$ to compare these measurements:
 a) $95\text{hg} \dots\dots 9\text{kg}$ b) $79\text{dag} \dots\dots 790\text{g}$ c) $69\text{hg} \dots\dots 9\text{kg } 8\text{dag}$
 5) Work out
 a) $950\text{g} + 5\text{dag} = \dots\text{kg}$ c) $15\text{hg} \times 8 = \dots\text{kg}$
 b) $5\text{kg} - 67\text{dag} = \dots\text{dag}$ d) $560\text{dag} : 7 = \dots\text{hg}$
 6) Solve the following problems:
 a) On Monday Butera bought 75kg of beans, on Tuesday 980hg and $7\ 600\text{dag}$ 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 flour for each family?

e)Extension activities

- 1) Convert the following units:
 a) $58\text{hg } 9\text{g} = \dots\text{g}$
 b) $87\text{dag } 9\text{g} = \dots\text{g}$
 c) $9\text{kg } 765\text{g} = \dots\text{g}$
 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) 895kg 6597hg.

b) 6 570g 657dag c) 96kg98kg 5dag.

5) Work out

a) $950\text{hg} + 8\,500\text{dag} = \dots\text{kg}$

b) $85\text{dag} - 767\text{g} = \dots\text{g}$

c) $225\text{hg} \times 6 = \dots\text{kg}$

d) $960\text{dag} : 8 = \dots\text{hg}$

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, in the afternoon she sold 75hg 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 9459kg of rice equally among 9 shopping houses. What is the quantity of rice for one shopping house?

UNIT 7: CAPACITY MEASUREMENT FROM LITER (l)TO MILLILITER (ml)

7.1 Key unit competence

Measure and compare the capacity of different objects in liter. Addition, subtraction, multiplication and division of capacity measurements from liter (l) to milliliter (ml).

7.2 Prerequisite

Pupils will easily learn this unit, if they have a good background on the capacity measurements related to liter (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 Generic competences to be developed

Cooperation: developed when pupils work collaboratively in group to develop interpersonal relations and life skills;

Communication: developed when pupils discuss either in groups or in the whole class, present findings, debate etc.

Creativity and innovation: developed when pupils make number cards, apply skills in solving real life problems, etc.

Problem solving: when pupils use acquired skills to solve problems from their real life situation.

Lifelong learning: when the learner is engaged in activities showing her/him to have the need for more learning with a curiosity of applying the knowledge learnt in a range of situations.

7.5 Unit key vocabularies or concepts

Liquid: A mater that can be poured.

A half liter: When a liter is divided in 2 two equal quantities, a half liter is equal to one quantity of them.

A quarter liter: When a liter is divided in 4 two equal quantities, a quarter liter is equal to one quantity of them.

7.6 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 facilitate 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.

7.7 Guidance on how to help learners with special education needs

- Provide to slow learners simple activities found in this book;
- Identify the level of physical impairment for some learners and facilitate them with appropriate learning resources;
- Identify talented pupils and give them more complex activities to retain them in learning without disturbing other classmates.

7.8 Sub-headings /list of lessons

UNIT 7: CAPACITY MEASUREMENT FROM LITER (l)TO MILLILITER (ml)			16 periods
	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 the capacity measurements	Measure the capacity measurements.	1
3	Reading and writing the capacity measurements	Read and write the capacity measurements.	1
4	Relationship between capacity measurements and their conversion	Show relationship between capacity measurements and their conversion.	2
5	Comparing capacity measurements	Compare capacity measurements.	1
6	ordering capacity measurements	Arrange the capacity measurements.	2
7	Addition capacity measurements	Add capacity measurements.	1
8	Subtraction of capacity measurements	Subtract capacity measurements.	1
9	Multiplying capacity measurements by a whole number	Multiply capacity measurements by a whole number.	1
10	Dividing capacity measurements by a whole number	Divide capacity measurements by a whole number.	1
11	Problems involving capacity measurements	Solve word problems involving	2

		capacity measurements.	
	End unit assessment	Measure and compare the capacity of different objects in liter, addition, subtraction, multiplication and division of capacity measurements from liter (ℓ) to milliliter (mℓ).	2

7.9 Teaching and learning activities

7.9.1 Lesson 1: Reading, writing and measuring the capacity of liquid containers.

a) Objectives

Knowledge:

Understanding the meaning of capacity of liquid in a container.

Skills:

- Read and write the capacity measurements.
- Use appropriate instruments to measure the capacity of liquids in containers.

Values

- Measure quickly and accurately;
- Develop the culture of kindness when measuring the capacity of liquid container.
- Appreciate the importance of capacity measurements in real life.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to: Work out different activities for using appropriate bottles to measure the capacity of liquid containers.

c) Teaching resources and learning resources

- Different bottles to be used when measuring the capacity of liquids in containers;
- Conversion table of capacity measurements.

d) Teaching and learning activities:

- Invite pupils to observe learning materials and explain instructions on activities to be done (use activity 7.1.1);
- 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.

e) Synthesis/summarization

Guide pupils to summarize how to measure the capacity and how to read and write them correctly.

f) Assessment

Provide activities to pupils from the pupil's book.

7.9.2 Lesson 2: Relationship between mass measurements and their conversion

a) Objectives

Knowledge:

Understanding the **conversion of capacity measurements using the relationship among them.**

Skills:

Draw a table of conversion and convert capacity measurements

Values

- Measure quickly and accurately;
- Develop the culture of kindness when measuring the capacity of different liquid containers.
- Appreciate the importance of capacity measurements in real life.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:
 - Work out different activities for reading and adding capacity measurement expressed in liters.
 - Organize learning materials to be used by pupils.

c) Teaching resources and learning resources

- Different bottles to be used when measuring the capacity of liquids in containers;
- Conversion table of capacity measurements.

d) Teaching and learning activities:

- Present a conversion table of capacity measurements to pupils, guide them to read capacity measurements in l , dl , cl and ml ; and ask pupils to write the given measurements in the table, and to convert from a unit to another;

- Organize groups of pupils and give them activities to do (for example Activity 7.3, and activity 7.4.1 and activity 7.4.2.
- 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 convert the units of capacity measurements.

e) Synthesis/summarization

Guide pupils to summarize the relationship 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.

f) Assessment

- Provide activities to be done by pupils (see application activity 6.4) and check their answers.
- Assign all pupils a homework to be done.

g) Answer for activities

Answers for self assessment 7.4

- a) 80dl c) 50ml e) 940cl.
 b) 70cl d) 920dl f) 390ml.

Answers for pair assessment 7.4

- a) 9 cl b) 80 l c) 7 l d) 6 l e) 5 dl f) 40 l

Answers for application activity 7.4

- a) 4 l c) 5680 ml e) 409 ml g) 759 cl
 b) 13 l d) 350 cl f) 2009 ml h) 3 dl.

7.9.3 Lesson 3: Comparing and ordering capacity measurements

a) Objectives

Knowledge:

Understand how to compare units of capacity measurement and to compare volumes of liquids expressed in capacity measurements.

Skills:

Measure and compare capacity measurements.

Values

- Measure quickly and accurately;
- Develop the culture of kindness when measuring the capacity of different liquid containers.
- Appreciate the importance of capacity measurements in real life.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:
 - Work out different activities for comparing the capacity of different liquid containers.
 - Organize learning materials to be used by pupils.

c) Teaching resources and learning resources

- Different bottles to be used when measuring the capacity of liquids in containers;
- Conversion table of capacity measurements.

d) Teaching and learning activities:

- Show pupils objects of different volume and ask them to compare their capacity before measuring (refer to activity 7.5.1.1, activity 7.5.1.2, activity 7.5.1.3);
- 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 $=$ (refer to activity 7.5.2.1, activity 7.5.2.2 and activity 7.5.3);
 - Organize groups of pupils and give them activities to do (for example activity 7.6.1, and activity 7.6.2) ;
 - 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 compare capacity of liquid containers.

e) Synthesis/summarization

- Guide pupils to summarize how to compare capacity of liquid containers: *use a conversion table to convert all capacities in the smallest unit given and then to compare obtained values.*

f) Assessment

- Provide activities to be done by pupils (use the application activity 7.5 and 7.6) and check their answers;
- Assign all pupils a homework to do.

g) Answer for activities

Answers for activity 7.5.3

- a) 8 l 7 cl > 25 dl 3 cl c) 98 dl > 9 l e) 45 cl 7 ml > 45 dl
 b) 67 dl = 670 cl d) 900 ml = 9 dl f) 593 cl < 94 dl

Answers for application activity 7.5

- a) 8 l 549 ml > 85 dl c) 3 dl 7 ml < 9 l e) 12 l 8 dl > 129 cl
 b) 96 dl = 960 cl d) 987 cl > 9 l 7 cl

Answers for activity 7.6.1

- a) 305 cl, 54 dl, 97 l c) 7 ml, 9 cl, 5 l, 94 dl
 b) 75 dl, 854 cl, 87 l d) 4 dl 9 ml, 697 cl, 8 l

Answers for self assessment 7.6.1

- a) 597 ml, 9 dl, 9 l c) 3 cl, 57 cl, 89 dl
 b) 9 ml, 67 dl, 792 cl d) 8 cl, 9 dl, 5 l

Answers for activity 7.6.2

- a) 978 dl, 9 l, 856 cl c) 59 dl, 589 cl, 5 l
 b) 8 l, 49 dl, 68 cl d) 8 dl, 746 ml, 67 cl

Answers for self assessment 7.6.2

- 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

Answers for application activity 7.6

- 1) a) 697 ml, 849 cl, 95 dl c) 879 ml, 549 cl, 87 dl
 b) 279 ml, 897 cl, 96 dl d) 647 ml, 67 dl, 748 cl
 2) a) 95 dl, 975 ml, 48 cl c) 86 dl, 7 l, 958 ml
 b) 875 cl, 8 l, 49 dl d) 98 dl, 971 cl, 624 ml

7.9.4 Lesson 4: Addition of capacity measurements

a) Objectives

Knowledge:

Understand the meaning of the sum of capacity measurements.

Skills:

- Use conversion tables to convert from one unit of capacity to another before adding them;
- Demonstrate addition of capacity using number sentences in the conventional manner.

Values

- Measure quickly and accurately;
- Develop the culture of kindness when measuring the capacity of different liquid containers.
- Appreciate the importance of capacity measurements in real life.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Organize learning materials to be used by pupils
- Guide pupils to:
 - Work out different activities for adding the capacity of different liquid containers.
 - Estimate the capacity of familiar containers by comparing them and guessing which one is 'heavier' or 'lighter'.

c) Teaching resources and learning resources

- Different bottles to be used when measuring the capacity of liquids in containers;
- Conversion table of capacity measurements.

d) Teaching and learning activities:

- Invite one pupil in front of others and guide him/her on how to demonstrate the addition of capacity measurements starting by measuring followed by conversion table to convert in the smallest unit or in the requested unit, and then add them using standard written method;
 - Organize groups of pupils and give them activities to do (for example Activity 7.7);
 - 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 capacity measurements;

e) 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.

f) Assessment

- Provide activities to be done by pupils (pair assessment 7.7 and self assessment 7.7 and application activity 7.7) and check their answers.
- Assign homework to be done by all pupils.

Note:

Concerning **the lesson on word problems involving addition of capacity measurements**, the teacher will help pupils to solve a one –step or a two-step problem:

Start by guiding pupils to solve some problems in groups or in a whole class discussion (use activity 7.8), provide problems to be solved into groups or in pairs (**pair assessment 7.8**) and then give problems to be solved individually (**self assessment 7.8**).

g) Answers for activities

Answers for pair assessment 7.8

1. Number of liters of milk we get per day: $42\text{ l} + 4800\text{cl} = 90\text{ l}$
2. Number of liters of cooking oil he sold altogether:

$$450\text{dl} + 5500\text{cl} = 10\text{ l}$$

Answers for self assessment 7.8

1. Quantity of water she uses every day:

$$75\text{ l} + 550\text{ dl} = 130\text{ l}$$

2. The capacity of water we use at my home every day:

$$200\text{dl} + 3\,000\text{ cl} + 60\text{ l} + 100\text{ l} = 210\text{ l}$$

Answers for application activity 7.8

1) Quantity of water they used altogether: $200\text{ dl} + 400\text{dl} + 100\text{ l} = 160\text{ l}$

2) Number of liters of fuel sold in those two days: $658\text{ l} + 2\,320\text{ dl} = 890\text{ l}$.

7.9.5 Lesson 5: Subtraction of capacity measurements

a) Objectives

Knowledge:

Understand the meaning of the difference of **capacity** measurements.

Skills:

- Use conversion tables to convert from one unit of **capacity** to another before subtraction;
- Demonstrate subtraction of **capacity** using number sentences in the conventional manner.

Values

- Measure quickly and accurately;
- Develop the culture of kindness when measuring the **capacity** of different liquids.
- Appreciate the importance of capacity measurements in real life.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:
 - Work out different activities for subtracting the capacity of different liquids.
- Organize learning materials to be used by pupils.

c) Teaching resources and learning resources

- Different bottles to be used when measuring the capacity of liquids in containers;
- Conversion table of capacity measurements.

d) 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, using a conversion table to convert in the smallest unit or in the requested unit, and then subtract using standard written method;
- Organize groups of pupils and give them activities to do (for example Activity 7.9);
- 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 capacity measurements.

e) 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.

f) Assessment

- Provide activities to be done by pupils (pair assessment 7.9, self assessment 7.9 and application activity 7.9) and check their answers.
- Assign homework to be done by all pupils.

Note:

Concerning **the lesson on word problems involving subtraction capacity measurements**, the teacher will help pupils to solve a one –step or a two-step problem:

Start by guiding pupils to solve some problems in groups or in a whole class discussion (use **activity 7.10**), provide problems to be solved into groups or in pairs (**pair assessment 7.10**) and then give problems to be solved individually (**self assessment 7.10**).

g) Answer for activities

Answers for pair assessment 7.10

- 1) Number of cl of water that were remained: $20 \text{ l} - 169 \text{ dl} = 310 \text{ cl}$
- 2) Number of liters that were consumed by our visitors: $3\ 000 \text{ dl} - 40 \text{ l} = 260 \text{ l}$

Answers for self assessment 7.10

- 1) Number of liters of water I remained with: $60 \text{ l} - 375 \text{ dl} = 225 \text{ dl}$
- 2) Number of liters of water he needed to complete his task: $225 \text{ l} - 1750 \text{ dl} = 50 \text{ l}$

Answers for application activity 7.10

- 1) Number of liters of water we need: $145 \text{ l} - 950 \text{ dl} = 50 \text{ l}$
- 2) Number of liters he remained with: $750 \text{ dl} - 38 \text{ l} = 37 \text{ l}$.

7.9.6 Lesson 6: Multiplication of capacity measurements by a whole number

a) Objectives

Knowledge:

Understand the meaning of the multiplication of capacity **measurements by a one digit number**

Skills:

- Demonstrate the multiplication of a capacity **measurement** by a whole number as a repeated addition;
- Calculate the product of capacity **measurements by a one digit number** using a standard written method.

Values

- Develop the capacity of quick critical thinking to find the product of capacity measurement by a whole number.
- Develop the culture of kindness when measuring the capacity of different liquids.
- Appreciate the importance of capacity measurements in real life.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:
 - Multiply a 3 digit number by one digit number;
 - Use concrete objects such as 3 bottles of water with the same quantity in liters for example 1liter and show that the multiplication of 11 by 3 is the total capacity of water from 3 bottles of the same capacity already put together.

c) Teaching resources and learning resources

- Different bottles to be used when measuring the capacity of liquids in containers;
- Conversion table of capacity measurements.

d) Teaching and learning activities:

- Invite one pupil in front of others and guide him/her on how to demonstrate the multiplication of capacity measurement by a number using concrete materials: two bottles of water where each one measures 1liter;
- Ask other pupils to say the total capacity for them when they are put together in the same container, then they will see that it is equal two $1\text{ l} \times 2 = 2\text{ l}$.
- Organize groups of pupils and give them activities to do (for example Activity 7.11);
- 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 capacity measurement by a number.

e) 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.**

f) Assessment

- Provide activities to be done by pupils (Pair assessment 7.11 and self assessment 7.11) and check their answers.
- Assign homework to all pupils.

Note

Concerning **the lesson on word problems involving multiplication of capacity measurements by a number**, the teacher will help pupils to solve a one –step or a two-step problem: Start by guiding pupils to solve some problems in groups or in a whole class discussion (use **activity 7.12**), provide problems to be solved into groups or in pairs (**pair assessment 7.12**) and then give problems to be solved individually (**self assessment 7.12 and application activity 7.12**).

g) Answer for activities

Answer for pair assessment 7.12

- 1) Number of dl she fetched: $15 \text{ l} \times 4 = 60 \text{ l}$
- 2) Number of liters of milk he got in 5 day: $32 \text{ l} \times 5 = 160 \text{ l}$

Answer for self assessment 6.12

- 1) Number of liters of milk do they consume altogether: $500 \text{ cl} \times 8 = 40 \text{ l}$
- 2) Number of liters of fuel does it consume in 6 days: $750 \text{ cl} \times 6 = 45 \text{ l}$

Answer for application activity 6.12

- 1) Number of liters of water used by Uwingabire: $250 \text{ dl} \times 6 = 150 \text{ l}$
- 2) Number of liters of water 9 pupils drink in 2 days: $(50 \text{ cl} \times 9) \times 2 = 90 \text{ dl}$.

7.9.7 Dividing a capacity measurement by a whole number

a) Objectives

Knowledge:

Understand the meaning of the division of capacity **measurement by a one digit number**.

Skills:

- Demonstrate the division of capacity by a whole number as a grouping of equal quantity of liquid from an initial container.
- Calculate the quotient of a capacity **measurement by a one digit number** using a standard written method.

Values

- Develop the capacity of quick critical thinking to find the quotient of capacity measurement by a whole number.
- Develop the culture of kindness when measuring the capacity of different liquids.
- Appreciate the importance of capacity measurements in real life.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:
 - Divide a 3 digit number by one digit number;
 - Use a concrete object such as a small jerry can containing 5litters of water to be shared equally in 5 small bottles and then measure the capacity for one small bottle.

c) Teaching resources and learning resources

- Different bottles to be used when measuring the capacity of liquids in containers;
- Conversion table of capacity measurements.

d) 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: bottle containing 5litters of water to be shared equally among 5 small bottles and measure the quantity for one bottle;
- Ask other pupils to say the capacity for water in one bottle: they will see that it is equal to 5 litters : $5 = 1$ litter;
- Organize groups of pupils and give them activities to do (for example Activity 7.13.1 and activity 7.13.2);
- 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 whole number.

e) 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 .

f) Assessment

- Provide activities to be done by pupils (pair assessment 7.13, self assessment 7.13 and application activity 7.13) and check their answers.
- Assign homework to all pupils.

Note

Concerning **the lesson on word problems involving the division of capacity measurements by a whole number**, the teacher will help pupils to solve a one –step or a two-step problem:

Start by guiding pupils to solve some problems in groups or in a whole class discussion (use **activity 7.14**), provide problems to be solved into groups or in pairs (**pair assessment 7.14**) and then give problems to be solved individually (**self assessment 7.14 and application activity 7.14**).

g) Answer for activities

Answer for pair assessment 7.14

- 1) Number of small jerry can of 5 l you can get: $500 \text{ dl} : 50 \text{ dl} = 10$.
- 2) Number of liters you will give to each child: $800 \text{ cl} : 8 = 100$.

Answer for self assessment 7.14

- 1) Number of cl will you give to each family: $450 \text{ dl} : 9 = 500 \text{ cl}$.
- 2) Number of cl of cooking oil she uses per day: $400 \text{ cl} : 8 = 50 \text{ cl}$.

Answer for application activity 7.14

- 1) Number of liters you will give to each child: $900 \text{ cl} : 9 = 100$
- 2) The share of each child: $560 \text{ dl} : 7 = 80$.

6.10 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) 72dl, 807 cl, 9 l.
4) 75 dl, 7 l 3 dl, 3cl 6 ml
5) a) 8 177 ml b) 9 900 ml c) 9 307 ml d) 9 900 ml
6) a) The difference of water we fetched: $950 \text{ dl} - 69 \text{ l} = 26 \text{ l}$
 b) Number of liters of cooking oil used in 8 days: $225 \text{ cl} \times 8 = 18 \text{ l}$
 c) Number of liters of water did we poured altogether: $67 \text{ l} + 1\,330 \text{ dl} = 200 \text{ l}$
 d) The share of each car in liters: $7\,500 \text{ cl} : 5 = 15 \text{ l}$
 e) 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 l 9 cl** =ml b) 28 dl =cl c) **8 dl 6 ml** = ...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) 987ml ... 9dl 8 ml b) 79 dl 856 cl
 c) 615ml 6dl 15ml
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 liters 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 liters of water. If he uses 1 987 dl when making bricks, how much water will remain?
c) Imena used a 10 litres jerrycan to fetch water. If he bought it 10 times, how much water did he fetch?
d) Share equally 225 liters 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) $4\text{ l } 456\text{ ml} \dots\dots 456\text{ ml}$

b) $978\text{ cl} \dots\dots 758\text{dl}$

c) $57\text{dl } 9\text{ ml} \dots\dots 5709\text{ ml}$

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) $6\text{ }384\text{ cl} : 8 = \dots \text{cl}$

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 liters, the second day we used 256 liters. Find the amount of water we used in the two days.

b) Uwamahoro poured 4678 dl of water from a water tank that 500 liters. Determine the quantity of water that remained in the tank.

c) Mugisha was fetching water with the use of a jerry can of 20 liters. If he fetched 19 times, how much water did Mugisha fetch?

d) Pour 975 liters of juice into 5 liters 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 Generic competences to be developed

Cooperation: developed when pupils work collaboratively in group to develop interpersonal relations and life skills;

Communication: developed when pupils discuss either in groups or in the whole class, present findings, debate etc.

Creativity and innovation: developed when pupils make a combination of notes and coins to totalise a given amount of money, etc.

Problem solving: when pupils use acquired skills to solve problems from their real life situation.

Lifelong learning: when the learner is engaged in activities showing her/him to have the need for more learning with a curiosity of applying the knowledge learnt in a range of situations related to the selling and buying.

8.5 Unit key vocabularies or concepts

- Coin:** A small round piece of metal, usually silver or copper colored, which is used as money.
- Notes:** A piece of paper money.
- Exchange:** to show the different combinations for a certain amount of money
- Change:** The money which is returned to someone who has paid for something which costs less than the amount that they gave.

8.6 Guidance on introductory activity 8

- Invite pupils to read the story of Kanani who does not know to differentiate the types of Rwandan currency 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 facilitate 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.

8.7 Guidance on how to help learners with special education needs

- Provide to slow learners simple activities found in this book;
- Identify the level of physical impairment for some learners and facilitate them with appropriate learning resources;
- Identify talented pupils and give them more complex activities to retain them in learning without disturbing other classmates.

8.8 Sub-headings / List of lesson

UNIT 8: RWANDAN CURRENCY FROM 1 Frw UP TO 5000 Frw			16 periods
	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 currency from 1 Frw up to 5000Frw	Observe the given picture 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 currency from 1 Frw up to 5000 Frw	Change the Rwandan currency from 1Frw up to 5000Frw.	2
4	Word problems involving addition of Rwandan currency from 1 Frw up to 5000 Frw	Solve word problems involving addition of Rwandan currency from 1 Frw up to 5000 Frw.	2
5	Word problems involving subtraction of Rwandan currency from 1 Frw up to 5000 Frw	Solve word problems involving subtraction of Rwandan currency from 1 Frw up to 5000 Frw.	2
6	Word problems involving multiplication of Rwandan currency from 1 Frw up to 5000Frw	Solve word problems involving multiplication of Rwandan currency from 1 Frw up to 5000Frw.	1
7	Word problems involving division of Rwandan currency from 1 Frw up to 5000 Frw by a whole number	Solve word problems involving division of Rwandan currency from 1 Frw up to 5000 Frw by a whole number.	2

8	Buying and selling	Buy and sell goods.	2
9	Saving and small income generating projects	Save and list small income generating projects.	2
	End unit assessment	Be able to use appropriately Rwandan currency from 1 Frw up to 5000 Frw.	1

8.9 Teaching and learning activities

8.9.1 Lesson 1: Characteristics and values of Rwandan currency from 1 Frw up to 5000 Frw

a) Objectives

Knowledge:

Understand the value of Rwandan money from 1 Frw up to 5000 FRW;

Identify Rwandan currency between 1Frw and 5000Frw

Skills:

- Count Rwandan money less than or equal to 5000 Frw;
- Describe each coin and note used in Rwandan Francs up to 5000Frw.
- Use Rwandan money from 1 Frw up to 5000 Frw in buying, selling and exchanging activities.
- Identify the source of money and proper use money.

Values

- Measure quickly and accurately;

- Develop the culture of trustworthy in using Rwandan money
- Using money in the right way
- Develop the culture of matching available money with your needs.
- Develop the culture of saving.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:

Work out different activities for describing coins and notes used in Rwandan francs up to 1000Frw;

c) Teaching resources and learning resources

Different coins and notes used in Rwandan francs up to 5000Frw;

d) 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 8.1.1);
- 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 and ask them to describe each of them: the value, the color, matter in which it is made;
- Assign groups the activity 8.1.2, activity 8.1.3 and activity 8.1.4 for discussion;
- Ask some groups to present the findings and guide the whole class to harmonize the core characteristics of coins and notes how to read them correctly.

e) Synthesis/summarization

Guide pupils to summarize the core characteristics of coins and notes how to read them correctly.

f) Assessment

Provide activities to pupils from the pupil's book (application activity 8.1).

Note:

After this lesson, the teacher can guide a session of discussing the importance of money (activity 8.2.1, activity 8.2.2 and activity 8.2.3) and the sources of money (activity 8.3.1, activity 8.3.2 and activity 8.3.3).

8.9.2 Lesson 2: Changing Rwandan currency from 1 Frw up to 5000 Frw

a) Objectives

Knowledge:

- Understand the value of Rwandan money from 1 Frw up to 5000 FRW;
- Identify Rwandan currency between 1Frw and 5000Frw

Skills:

- Count Rwandan money less than or equal to 5000 Frw;
- Demonstrate different combinations of notes and coins to represent a given amount of money;

Values

- Measure quickly and accurately;
- Develop the culture of trustworthy in using Rwandan money
- Develop the habit of using money in the right way;
- **Develop the culture of saving money.**

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Organize learning materials to be used by pupils.
- Guide pupils to:

- Work out different activities for combinations of notes and coins to represent a given amount of money not exceeding 5000 Frw;

c) Teaching resources and learning resources

Different coins and notes used in Rwandan francs up to 5000Frw;

d) Teaching and learning activities:

- Present notes and coins used in Rwanda to pupils, guide them to change an amount of money using other coins and notes;
- Organize groups of pupils and give them activities to do (for example Activity 8.4 and activity 8.5 and pair assessment 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 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.

e) Synthesis/summarization

Guide pupils to summarize how to combine notes and coins to represent a given amount of money.

f) Assessment

- Provide activities to be done by pupils (see self-assessment 8.5 and application activity 8.5) and check their answers.
- Assign all pupils a homework to be done.

g) Answer for activities

Answer for activity 8.4

1) a) $1\ 000\ \text{Frw} = 500\ \text{Frw} + 500\ \text{Frw}$

b) $2\ 000\ \text{Frw} = 1\ 000\ \text{Frw} + 1\ 000\ \text{Frw}$

c) $5\ 000\ \text{Frw} = 1\ 000\ \text{Frw} + 1\ 000\ \text{Frw} + 1\ 000\ \text{Frw} + 1\ 000\ \text{Frw}$

2) a) $2\ 000\ \text{Frw} = 1\ 000\ \text{Frw} + 1\ 000\ \text{Frw}$

b) $5\ 000\ \text{Frw} = 2\ 000\ \text{Frw} + 1\ 000\ \text{Frw} + 2\ 000\ \text{Frw}$

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 Frw + 500 Frw + 500 Frw.

e) 500 Frw = 100 Frw + 100 Frw + 100 Frw + 100 Frw + 100 Frw.

3) a) 3 000 Frw = 1 000 Frw + 1 000 Frw + 1 000 Frw.

b) 4 000 Frw = 2 000 Frw + 1 000 Frw + 500 Frw + 500 Frw.

c) 2 000 Frw = 1 000 Frw + 500 Frw + 500 Frw.

d) 5 000 Frw = 1 000 Frw + 2 000 Frw + 1 000 Frw + 1 000 Frw.

e) 3 500 Frw = 2 000 Frw + 500 Frw + 1 000 Frw.

Answers for pair assessment 8.5.2

a) One note of 1 000Frw and two coins of 100 Frw.

b) One note of 500 Frw and 4 coins of 100 Frw.

c) Three notes of 500 Frw and 3 coins of 100 Frw.

d) Two notes of 2 000 Frw and 1 note of 500 Frw.

e) Two notes of 1 000 Frw and 44coins of 100 Frw.

f) One note of 2 000 Frw and 3 notes of 500 Frw.

8.9.3 Lesson 3: Word problems involving addition of Rwandan currency from 1 Frw up to 5000 Frw

a) Objectives

Knowledge:

Understand the meaning of the sum of money and where it is applicable

Skills:

- Use and apply knowledge of money in real life;

- Demonstrate addition of money using number sentences in the conventional manner;

- Emphasize addition of money using standard written method.

Values

- Count money quickly and accurately;

- Develop the culture of trustworthy in using Rwandan money

- Develop the habit of using money in the right way;

- **Develop the culture of saving money.**

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

➤ Plan how to help pupils with different impairments;

➤ Organize learning materials to be used by pupils;

➤ Guide pupils to:

Work out different activities for adding money in different coins and notes.

c) Teaching resources and learning resources

- Different coins and notes used in Rwandan francs up to 5000Frw;
- Different scenarios involving the need for adding money.

d) 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 (for example Activity 8.6 and pair assessment 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 add money.

e) Synthesis/summarization

- Guide pupils to summarize when and how to add money: using the standard written method.

f) Assessment

- Provide activities to be done by pupils (self-assessment 8.6 and application activity 8.6) 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.

g) Answers for activities

Answers for pair assessment 8.6

- 1) He paid: $1500\text{Frw} + 500\text{Frw} = 2\,000\text{Frw}$.
- 2) He paid altogether: $3\,500\text{Frw} + 900\text{Frw} = 4\,400\text{Frw}$

Answers for self assessment 8.6

- 1) The money he gave them altogether:
 $750\text{Frw} + 1\,450\text{Frw} + 1\,150\text{Frw} + 950\text{Frw} = 4\,300\text{Frw}$
- 2) The money he bought the whole gift:
 $1\,500\text{Frw} + 500\text{Frw} + 2\,000\text{Frw} + 4\,100\text{Frw} = 5\,000\text{Frw}$.

Answers for application activity 8.6

- 1) Their total cost is 3 470Frw;
- 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: $3400\text{Frw} + 1300\text{Frw} = 4\,700\text{Frw}$.

8.9.4 Lesson 4: Word problems involving subtraction of Rwandan currency from 1 Frw up to 5000 Frw

a) Objectives

Knowledge:

Understand the meaning of the subtraction of money and where it is applicable.

Skills:

- Use and apply knowledge of money in real life;
- Demonstrate the subtraction of money using number sentences in the conventional manner;
- Emphasize subtraction of money using standard written method.

Values

- Count money quickly and accurately;
- Develop the culture of trustworthy in using Rwandan money
- Develop the habit of using money in the right way;
- **Develop the culture of saving money.**

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Organize learning materials to be used by pupils;
- Guide pupils to:

Work out different activities for subtracting money in different coins and notes.

c) 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.

d) 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;
- Organize groups of pupils and give them activities to do (for example Activity 8.7 and pair assessment 8.7);
- 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.

e) Synthesis/summarization

Guide pupils to summarize when and how to make a difference of money: using the standard written method.

f) Assessment

- Provide activities to be done by pupils (self-assessment 8.7 and application activity 8.7) 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.

g) Answers for activities

Answers for pair assessment 8.7

- 1) She used: $400\text{Frw} + 450\text{Frw} = 850$ and
The balance became: $1000\text{Frw} - 850\text{Frw} = 150\text{Frw}$
- 2) To buy the trouser, she needs: $5000\text{Frw} - 4500\text{Frw} = 500\text{Frw}$

Answers for self assessment 8.7

- 1) The money Kaneza bought that bucket: $4\ 100\text{Frw}$
- 2) The money I remained with: $4\ 500\text{Frw} - 3\ 900\text{Frw} = 600\text{Frw}$

Answers for application activity 8.7

- 1) The balance is: $5\ 000\ \text{Frw} - 3\ 750\ \text{Frw} = 1\ 250\ \text{Frw}$
- 2) The money I remained with: $5\ 000\ \text{Frw} - 3\ 900\ \text{Frw} = 1\ 100\ \text{Frw}$.

8.9.5 Lesson 5: Word problems involving multiplication of Rwandan currency from 1 Frw up to 5000 Frw by a whole number

a) Objectives

Knowledge:

Understand the meaning of the multiplication of an amount of money **by a one digit number**

Skills:

- Demonstrate the multiplication of money by a whole number as a repeated addition;
- Calculate the product of money **by a one digit number** using a standard written method.

Values

- Develop the capacity of quick critical thinking to find the product of money by a whole number.
- Develop the culture of kindness when counting money.

- Appreciate the importance of money in real life.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:

- Multiply a 3 digit number by one digit number;
- Use a scenario where for example 3 pupils are given the same amount of money whose sum does not exceed 1000 and ask pupils to find the total money for those 3 pupils.

c) 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.

d) 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;
- 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 $100\text{Frw} + 100\text{Frw} + 100\text{Frw} + 100\text{Frw} = \mathbf{100\text{ Frw} \times 4} = 400\text{Frw}$.
- Organize groups of pupils and give them activities to do (for example Activity 8.8 and pair assessment 8.8);
- 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.

e) 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.**

f) Assessment

- Provide activities to be done by pupils (self assessment 7.11 and application activity 8.8) 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.

g) Answers for activities

Answer for pair assessment 8.8

1) a) 600 Frw b) 3 600 Frw c) 4 000 Frw d) 5 000 Frw

2) $85 \text{ Frw} \times 27 = 2\,040 \text{ Frw}$

Answer for self assessment 8.8

1) $80 \text{ Frw} \times 119$

2) $250 \text{ Frw} \times 8 = 2\,000 \text{ Frw}$

3) $(1\,400 \text{ Frw} \times 3) + 800 \text{ Frw} = 5\,000 \text{ Frw}$

Answer for application activity 8.8

1) 9 600 Frw 2) 4 200 Frw 3) 4 500 Frw

8.9.6 Lesson 6: Word problems involving division of Rwandan currency from 1 Frw up to 5000 Frw by a whole number

a) Objectives

Knowledge:

Understand the meaning of the division of an amount of money **by a one digit number**.

Skills:

- Demonstrate the division of an amount of money by a whole number as a sharing equally an amount of money among a number of people.
- Calculate the quotient of money **by a one digit number** using a standard written method.

Values

- Develop the capacity of quick critical thinking to find the quotient of money by a whole number.
- Develop the culture of kindness when counting money.
- Appreciate the importance of money in real life.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to:

- Multiply a 3 digit number by one digit number;
- Use a scenario where for example 1000Frw is to be shared equally among 2 pupils and ask pupils to find the share for one pupil.

c) 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.

d) 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 to **1000Frw: 4 = 250 Frw**.
- Organize groups of pupils and give them activities to do (for example Activity 8.9 and pair assessment 8.9);
- 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.

e) Synthesis/summarization

Guide pupils to summarize how to divide an amount of money by a number: **use the standard written method and copy the unity of money which is Frw.**

f) Assessment

- Provide activities to be done by pupils (self-assessment 8.9 and application activity 8.9) 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.

8.9.7 Lesson 7: Buying and selling

a) Objectives

Knowledge:

Understand how to use money when buying and selling.

Skills:

- Demonstrate the ability to buy elementary goods using money less or equal to 5000Frw

Values

Develop the culture of buying good you need depending on the money available.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Organize learning materials;
- Guide pupils to discuss scenarios for buying and selling using the money less than 5000Frw.

c) 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.

d) 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 8.10 and application activity 8.10);
 - 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.

e) Synthesis/summarization

Guide pupils to summarize how to plan what one can buy depending on the money he/she has.

f) Assessment

- Provide activities to be done by pupils and check their answers.
- Assign homework to all pupils.

g) Answers for application activity 8.10

- 1) $800 \text{ Frw} \times 5 = 4\,000 \text{ Frw}$
- 2) $(2\,000 \text{ Frw} \times 3) + 1\,200 \text{ Frw} = 7\,200 \text{ Frw}$
- 3) $(1\,200 \text{ Frw} \times 2) + (4 \times 500 \text{ Frw}) = 4\,400 \text{ Frw}$
- 4) $2\,500 \text{ Frw} + (4 \times 500 \text{ Frw}) = 4\,500 \text{ Frw}$
- 5) $(800 \text{ Frw} \times 3) + 1\,200 \text{ Frw} + 1\,200 \text{ Frw} = 4\,800 \text{ Frw}$

8.9.8 Lesson 8: Importance of saving

a) Objectives

Knowledge:

Understand the importance of saving money.

Skills:

Explain different ways of saving money and show the ability to save money.

Values

Develop the habit of saving money to be used when solving serious problems.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Organize learning materials;
- Guide pupils to discuss scenarios for saving the money less than 5000Frw.

c) 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 importance of saving money.

d) Teaching and learning activities

Prepare a scenario in which pupils discuss the importance of saving money and different ways of doing it:

- Guide pupils to read the story on saving money as it is given in the activity 8.11.1
- Guide them to discuss lessons learnt from the story and different ways of saving money.
- Organize groups of pupils and give them activities to do (for example Activity 8.11.2 and activity 8.11.3);
- 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 what they can do to save money.

e) Synthesis/summarization

Guide pupils to summarize the importance of saving and what they will do to save money.

f) Assessment

- Provide activities to be done by pupils and check their answers.
- Assign homework to all pupils.

8.9.9 Lesson 9: Small income generating projects

a) Objectives

Knowledge:

Understand the income generating projects and their importance.

Skills:

Explain different income generating projects of his/her age and how to implement them.

Values

Develop the culture of creating small income generating projects appropriate to his/her age.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Organize learning materials;
- Guide pupils to discuss scenarios on income generating project and how it saves people when they are in dilemma.

c) 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.

d) Teaching and learning activities:

Prepare a scenario in which pupils discuss the importance of small income generating project and different ways of creating some of them:

- Guide pupils to read stories on small income generating projects as it is given in the activity 8.12.1
- Guide them to discuss lessons learnt from the stories and different ways of making small income generating projects.
 - Organize groups of pupils and give them activities to do (for example Activity 8.12.2 and pair assessment 8.12);
 - 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.

e) Synthesis/summarization

Guide pupils to summarize different ways of making small income generating projects and what they will do to create their own projects.

f) Assessment

- Provide activities to be done by pupils and check their answers.
- Assign homework to all pupils.

8.10 Ending points of the unit

a) Summary of the unit

As a teacher, 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;
- Explain clearly the use of money when buying and selling in concrete situations;
- Teach pupils how to add, subtract money using a standard written method but also emphasize how to do it with mental calculation
- Invite pupils to be aware of money exchange;
- Ask pupils to discuss cashless ways of buying: use of cards, mobile money, mobile banking etc.
- Pose to pupils, daily problems in the form of words, tables and pictorials.

c) 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 \times 10) + 1 000 Frw
- 2) a) 3 500 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.

d. 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 on 500 Frw, a packet of tea on 200Frw and the rice of 1000 Frw. How much money did he pay? What is the balance 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?

e) 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 went 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 worker 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:
- 2 liters of milk on 400Frw per one liter
 - One liter of cooking oil on 18000Frw
 - 2kg of beans on 7000frw per 1 kg;
 - 2kg of rice on 1200Frw per 1kg.
 - 2kg of sugar on 1200Frw per 1kg.
 - 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 Generic competences to be developed

Cooperation: developed when pupils work collaboratively in group to develop interpersonal relations and life skills;

Communication: developed when pupils discuss either in groups or in the whole class, present findings, debate etc.

Creativity and innovation: developed when pupils imagine a time, illustrate it on a clock face and tell it to colleagues; or when a pupil applies acquired skills in solving real life problems.

Problem solving: when pupils use acquired skills to solve problems from their real life situation.

Lifelong learning: when the learner is engaged in activities showing her/him to have the need for more learning with a curiosity of applying the knowledge learnt in a range of situations.

9.5 Unit key vocabularies or concepts

- **Common year:** It is an year of 365 days.

- **A leap year:** it is a special year with 366 days which occurs when the month of February has 29 days.

- **A calendar:** It is a chart showing days, weeks and months of a particular year. A calendar helps us to identify days and be informed of special days like Christmas, Independence Day, school term opening and closing days, birthdays, etc

9.6 Guidance on introductory activity 9

- 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 consider 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 facilitate 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.

9.7 Guidance on how to help learners with special education needs

- Provide to slow learners simple activities found in this book;
- Identify the level of physical impairment for some learners and facilitate them with appropriate learning resources;

– Identify talented pupils and give them more complex activities to retain them in learning without disturbing other classmates.

9.8 Sub-headings /list of lessons

UNIT 9: TIME MEASUREMENTS			24 periods
	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.	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	Reading, telling and writing a half to an hour.	Read, tell and write a half to an hour.	2
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.	2
6	Reading, telling and writing a quarter to an hour	Read, tell and write a quarter to an hour.	2
7	Use of a calendar	Be able to appropriately use calendar.	2
8	Converting days into hours	Convert days into hours.	2
9	Converting weeks into days	Convert weeks into days.	2
10	Converting years into months	Convert years into months.	2
11	Ordinary year and leap year	Be able to distinguish an ordinary year from a leap year.	2
12	Planning daily, weekly and monthly activities	Prepare a daily, weekly and monthly activities plan.	2
	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.	2

9.9 Teaching and learning activities

9.9.1 Lesson 1: Reading, telling and writing the time shown by a clock face

9.9.1.1 Reading, telling and writing an hour O'clock

a) Objectives

Knowledge:

Understand the time shown by a clock face or a digital watch.

Skills:

Read and tell the time shown by both clock face and digital watch.

Values

- Develop the spirit of time management
- Appreciate the value of time in daily situations
- Develop the spirit of orderliness and the respect time

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to work out different activities for telling the time in hours as it was learnt in P2.

c) 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).

d) 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);
- 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 the pair assessment 9.1.1 and other activities for discussion;
- 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.

e) 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.**

f) Assessment

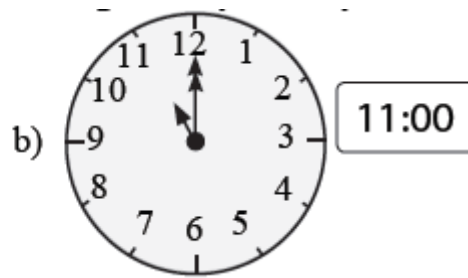
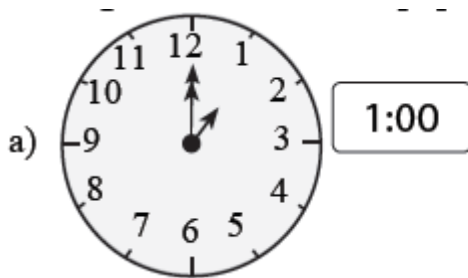
Provide activities to pupils from the pupil's book (Use for example the application activity 9.11).

g) Answers for activities

Answers for activity 9.11

- a) Two o'clock c) Nine o'clock e) Eight o'clock
b) Eight o'clock d) Seven o'clock f) Nine o'clock

Answers for pair assessment 9.11



Answers for application activity 9.11

- a) Two o'clock c) four o'clock e) Three o'clock
b) three o'clock d) Two o'clock f) Four o'clock

9.9.1.2 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 and the self-assessment 9.1.2.

- **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.

9.9.1.3 Reading, telling and writing a half to or thirty 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 **half to an hour or thirty minutes to an hour**. It will be guided by activity 9.1.3 and the self-assessment 9.1.3 and application activity 9.1.3.

- **Synthesis/summarization**

Guide pupils to summarize how to read, tell and write the time related to **half to an hour or thirty minutes to 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 next (coming) hour.

- **Answers for activities:** Find the answers for the above mentioned activities and mark pupils' findings accordingly.

9.9.1.4 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, the pair assessment 9.1.4, the self-assessment 9.1.4 and the application activity 9.1.4.

- **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.

9.9.1.4 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, the pair assessment 9.1.4 and the application activity 9.1.5.

- **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.

9.9.2 Lesson 2: Use of a calendar

a) Objectives

Knowledge:

- Name and identify the months of the year and days of each month.
- Identify public holidays and weekends on a calendar

Skills:

- Read and tell the date on the calendar;
- Make a calendar when the reference day and date is given.
- Show days for public holiday on a calendar.

Values

- Develop the spirit of time management
- Appreciate the value of time in daily situations
- Develop the spirit of orderliness and the respect time.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Guide pupils to work out different activities for telling the days of a week and months of a year.

c) 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.

d) 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.

e) 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.

f) Assessment

Provide activities to be done by pupils.

g) Answers for activities:

Find the answers for the above mentioned activities and mark pupils' findings accordingly.

9.9.3 Lesson 3: 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 9.4.1, activity 9.4.2 and application activity 9.4.

9.9.4 Lesson 4: Relationship between units of time

a) Objectives

Knowledge:

Understanding the relationship among year and months, month and days, day and hours.

Skills:

- Convert years into months.
- Convert weeks into days.
- Convert days to hours.
- Determine how old person is given the year of his birth.

Values

- Calculate quickly and accurately;
- Develop the critical thinking when converting time measurements;

- Appreciate the importance of the conversion of time measurements.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Organize learning materials to be used by pupils.
- Guide pupils to work out different activities for converting days into hours and vice versa.

c) 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.

d) Teaching and learning activities:

- 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 9.5.1, activity 9.6 and activity 9.7).
- 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.

e) Synthesis/summarization

Guide pupils to summarize the relationship between time measurements, and how to convert from a unit to another. For example, 1 day = 24 hours, 1 week = 7 days, 1 year = 52 weeks and 1 year = 12 months, 1 year = 365 days.

f) Assessment

- Provide activities to be done by pupils and check their answers.
- Assign all pupils a home work to be done.

g) Answer for activities

Find the answers for the above mentioned activities and mark pupils' findings accordingly.

9.9.5 Lesson 5: Planning daily, weekly and monthly activities

a) Objectives

Knowledge:

Understand how to plan activities of a day, a week or a month.

Skills:

Plan activities for a day, plan activities of a week, plan activities of a month.

Values

- Develop the habit of being well organized in activities to be done;
- Develop the critical thinking in your activity plans;
- Appreciate the importance of planning activities.

b) Prerequisites /Introduction

To perform well in this lesson, do the following:

- Plan how to help pupils with different impairments;
- Organize learning materials to be used by pupils.
- Guide pupils to work out different activities for planning daily activities as it was learnt in P1 and P2.

c) 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 Kamaliza).
- Hand outs with different activities to be done by pupils.

d) Teaching and learning activities:

- Ask pupils to say 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 be done where they have to refer to planned activities (for example activity 9.8.11. activity 9.8.2.1 and activity 9.8.3.1) 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.

e) Synthesis/summarization

- Guide pupils to summarize how to plan activities for a day, for a week and for a month.

f) Assessment

- Provide individual activities to be done by every pupil (use the activity 9.8.1.2, activity 9.8.2.2 and the activity 9.8.3.2) and check their answers;
- Assign all pupils a home work to do.

9.10 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

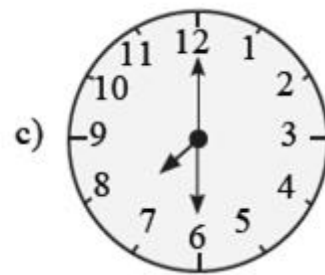
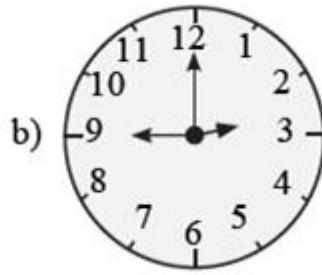
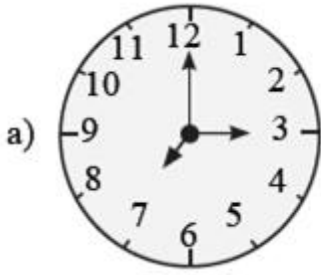
- 1) a) It is a quarter to two. b) It is ten o'clock
 c) It is a half past seven. d) It is ten o'clock.

- 2) 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 b) 7/ 24 c) 4 / 52 d) February.
 4) Ordinary years are: 2002, 2007, 2005.
 5) Leap years are: 2000, 2016, 2008, 2012.
 6) Leap years between 2010 and 2010 are: 2012 ; 2016 ; 2020 ; 2024 ; 2028.

d. Remedial activities

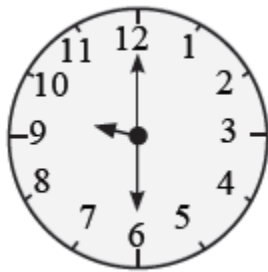
- 1) Read and tell the time:



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:

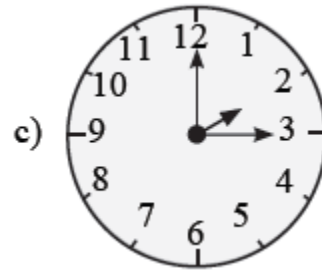
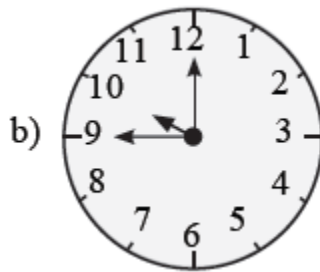
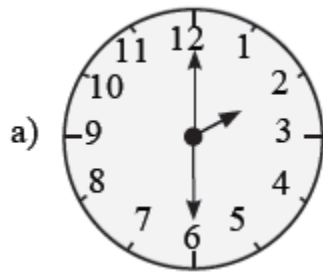
a) April: 30 days, October: 31 days, December: 31 days.

b) Give 3 months which have 31 days.

Answer: January, March, May, etc.

e) Extension activities

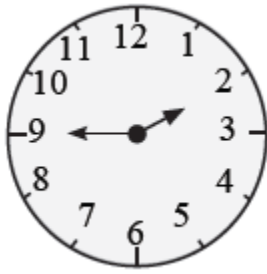
1) Read and tell the time:



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 Generic competences that a learner develops from the lessons

- Critical Thinking and being cautious while doing exercises.
- Cooperation and interpersonal skills as he or she work with others in different activities.
- Problem-solving skills in relation to drawing the geometric figures of a square, rectangle and triangle as well as calculating the perimeter of gardens with shapes of a square, rectangle or triangle.
- Appropriate communication skills when explaining the characteristics of a square, rectangle and triangle.
- **Creativity and innovation:** developed when pupils make different lines and angles representing objects seen in real life

- Lifelong learning skills as learners show curiosity to learn more in Mathematics.

10.4 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

10.5 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 facilitate 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.

10.6 How the teacher takes care of children with special needs education

- Slow learners are provided with simple exercises compared to the rest of the class as found in the teacher's book.
- Those with physical disabilities-First determine what the disabilities are and prepare Teaching and Learning resources and exercises to suit the needs of each learner.
- Quick/Fast learners-provide them with exercises found in the teachers book so that they are busy and don't disrupt others.

10.7 Key words used in this unit

Protractor: mathematical instrument used to measure angle sizes

Ruler: Mathematical instrument used to draw lines

Right Angle: Angle equal to 90 degrees

Obtuse Angle: Angle greater than 90 degrees

Acute Angle: Angle less than 90 degrees.

10.8 Sub-headings / List of lessons nit

UNIT 10: TYPES OF LINES AND ANGLES			16 Periods
	Lesson title	Learning objectives	Number of periods
0	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	Straight parallel lines	Observe, differentiate and draw straight parallel lines.	1
3	Straight perpendicular lines	Observe, differentiate and draw straight perpendicular lines.	1
4	Straight intersecting lines	Observe, differentiate and draw straight intersecting lines.	1
5	Right angle	Identify and draw right angle.	1
6	Obtuse angle and Acute angle	Identify and draw an obtuse and an acute angle.	2
7	Measuring angles.	Measure angles using a protractor.	2
8	Drawing angles.	Draw angles using a ruler and protractor.	2
9	Comparing angles	Compare the values of angles.	2
	End unit assessment	Draw and identify parallel, perpendicular and intersecting lines. Draw and compare right, acute	2

		and obtuse angles.	
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10.9 Guidance on different lessons

10.9.1 Lesson 1: Types of Lines

a) Objective

- **Knowledge**
To know the different types of lines.
- **Skills**
Differentiate and draw types of lines.
- **Values**
Showing the concern of beautification and tessellation

b) Prerequisites/Introduction

Pupils will learn effectively in this lesson when

- They refer to types of lines and angles learnt in P2 (Unit 10)
- The teacher distributes enough Teaching and Learning resources that will be used in the lesson in drawing lines;
- The teacher prepares how to assist learners who may need special support during the lesson.

c) Teaching and Learning resources

Manila Paper, Rulers, meter ruler, T-square, different colored pencils.

d) Teaching and Learning Activities

- Invite pupils, show them lines and ask them to give their relationships (activity **10.1.1.1** and **activity 10.1.1.2**);
- Form groups of pupils and then ask them to describe and draw straight lines, intersecting lines, broken lines, parallel lines, crossing lines and to give instruments or objects where those types of lines are observed in real life (activity 10.1.2, activity 10.1.3 and activity 10.1.4);
- 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 for each types of line;
- Ask pupils to observe carefully and give the names of the lines that form a right angle, an acute angle or an obtuse angle.
- Give every pupil time to draw at least one of each of the types of lines learnt.

Synthesis/summarization

Direct pupils to explain briefly the different types of lines and how to draw them.

Assessment

Give pupils application activities on types of lines found in the pupils' book.

Answers to 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.

10.9.2 Lesson 2: Types of angles

a) Objective

Knowledge

Know different types of angles.

Skills

Distinguish and draw different types of angles.

Values

Showing the concern of beautification and tessellation

b) Prerequisites/Introduction

Different exercises to distinguish different types angles and how to draw angles

Give pupils enough Teaching and Learning resources to use to draw angles

Prepare how you to assist learners who may need special support during the lessons

c) Teaching and Learning resources

Manila Paper, Rulers, Meter ruler, T-square, different colored pencils, protractor.

d) Teaching and Learning Activities

- Invite pupils to work in groups and discuss activity 10.2.1, activity 10.2.2 and activity 10.2.3, to draw a right angle, acute angle and an 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 a right angle, acute angle and an obtuse and how to draw them;

- Ask the pupils to observe carefully and give the names of the lines that form a right angle, an acute angle or an obtuse angle.
- Give every pupil time to draw a right angle, obtuse angle and an acute angle.

Summary of topic taught

Direct pupils to name briefly the different types of angles and how to draw them.

- Assessment

Give pupils application activities to be done from in the pupils' book on types of angles.

e) Answers to activities

Answers for application activity 10.2.1.b

- 1) Answers are different depending on what each pupil sees on the picture.
- 2) a) Right angle b) Acute angle c) Obtuse angle

10.9.3 Lesson 3: Measuring and drawing angles with a protractor

a) Objective

Knowledge

Know how to use a protractor to measure angles.

Skills

Draw different angles .

Values

Showing the concern of beautification and tessellation

b) Prerequisites/Introduction

Different activities to draw right angle

c) Teaching and Learning resources

Manila Paper, Rulers, Meter ruler, T-square, different colored pencils, protractor.

d) 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);

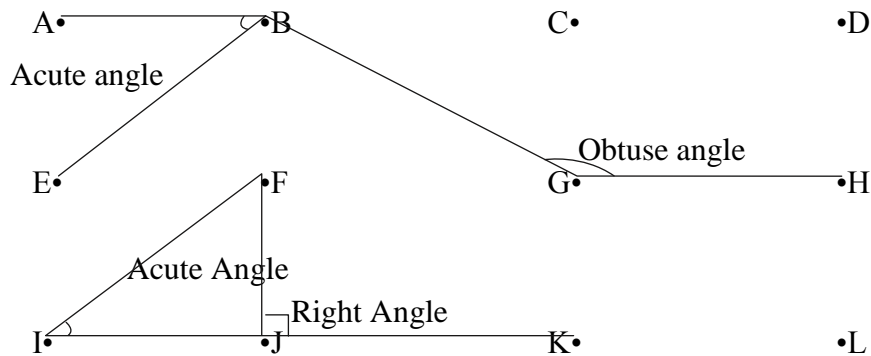
- Invite each pupil to use his/her materials and draw angles of different values you assign to them;
- Move around in the classroom to guide slow learners and show them how to draw angles in their notebooks;
- Help all pupils to harmonize step by step how to draw angles:
 - Place the protractor so that 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.

e) 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

2.



10.9.4 Lesson 4: Comparing angles

a) Objective

Knowledge

Know to explain the comparison of angles.

Skills

- Use the value of angle and compare them;
- Observe angles and compare them.

Values

Show the concern of beautification and tessellation.

b) Prerequisites/Introduction

Verify whether pupils are able to use greater than or less than when comparing angles at it was learnt in P2.

c) Teaching and Learning resources

Manila Paper, Rulers, Meter ruler, T-square, different colored pencils, protractor.

d) 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);

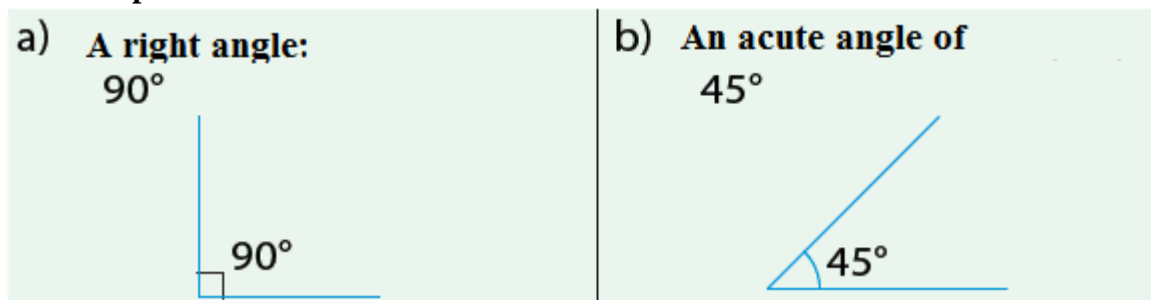
Ask pupils to use the values obtained to compare angles: $90\text{degrees} > 30\text{degrees}$;

- Assign groups of pupils to do the **activity 10.4.2** and **activity 10.4.3**

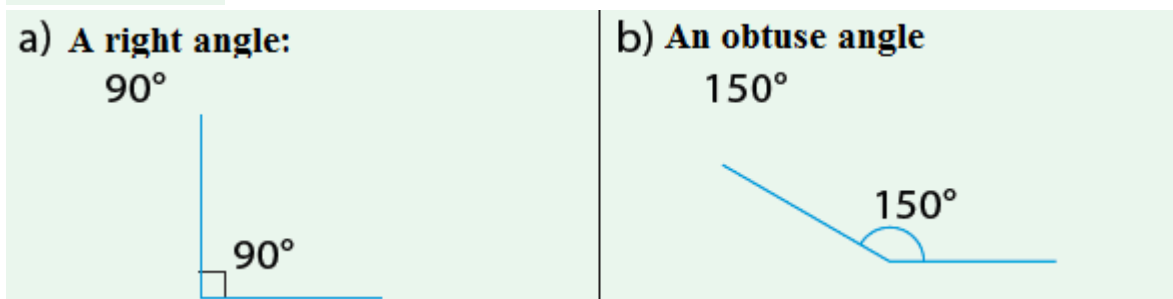
- Move around in the classroom to guide learners and show them how to draw compare angles by drawing and by using their values in degrees;

- Invite some groups to present their findings and guide all pupils to harmonize the how to compare angles:

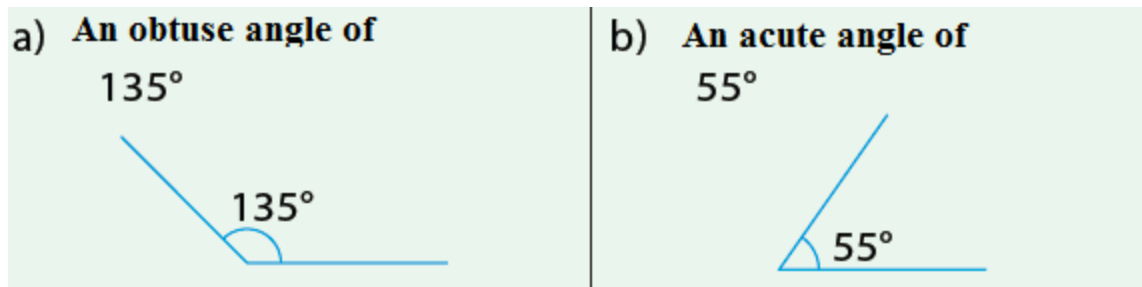
For example: $90^\circ > 45^\circ$



$90^\circ < 150^\circ$



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**).

10.10 Ending points of the unit 10

10.10.1 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.

10.10.2 Additional information for the teachers

- Being able to manage all activities while taking care of the needs of every pupil
- Explain clearly information about types of lines and angles relating this to their use in everyday life.
- Know how to prepare and use different Teaching and Learning resources
- Know how to emphasize and deliver the key points during teaching
- Know how to teach mathematics based on competence based curriculum
- Know how to quickly draw lines and angles and how to determine if they are straight
- Know how to draw using hands and using geometrical instruments.

10.10.3 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

10.10.4 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.

10.10.5 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 Generic competences to be developed

- Cooperation and interpersonal skills: when a pupil works with others in a groups or cooperates with other
- Communication skills: when a pupil writes or reads the words square, rectangle, triangle or circle
- Problem solving skills: when the pupil is able to use teaching/learning aids making them themselves and keeping them properly.

11.5 Key terms/concepts

Isosceles Triangle: Triangle with two equal sides

Equilateral triangle: Triangle whose all sides are equal

Right-angled Triangle: Triangle whose two sides make a right angle

Any triangle: Triangle for which all sides are different in length

Diameter: A line passing through the center of a circle and dividing the circle into two equal halves.

Centre: A point that is at equal distance from all sides of the circle.

Radius: a line segment from the centre of a circle that touches the circumference of the circle.

Diagonal: A line that connects two vertices of a figure through the centre.

Line of symmetry: A line that divides a figure into two congruent parts.

11.6 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.

11.7 Guidance on how to support learners with special educational needs

- Slow learners are provided with simple activities compared to the rest of the class as found in the teacher's book.
- Those with physical disabilities: First determine what the disabilities are and prepare Teaching and Learning resources and activities to suit the needs of each learner.
- Quick/Fast learners: provide them with activities found in the teacher's book so that they don't disrupt others.

11.8 List of subtopics/ lessons

	UNIT 11: SQUARE, RECTANGLE, TRIANGLE AND CIRCLE	16 periods
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	Properties of a square	Describe properties of a square.	1
3	Perimeter of a square	Measure and calculate the perimeter of a square.	1
4	Properties of a rectangle	Describe properties of a rectangle.	1
5	Perimeter of a rectangle	Measure and calculate the perimeter of a rectangle.	2
6	General properties of a triangle	Describe properties of a triangle.	1
7	Properties of an equilateral triangle	Describe properties of an equilateral triangle.	1
8	Properties of an isosceles triangle	Describe properties of an isosceles triangle.	1
9	Properties of a right angled or right triangle	Describe properties of a right angled or right triangle.	1
10	Properties of a scalene triangle	Describe properties of a scalene triangle.	1
11	Perimeter of a triangle	Calculate the perimeter of a triangle	2
12	Properties of a circle	Describe properties of a circle	2
	Unit assessment	Draw and describe a square, rectangle, triangle and circle, find the perimeter of a square, rectangle and triangle.	1

11.9 Guidance on different lessons

11.9.1 Lesson 1: Characteristics of a square

a) Learning objective

Knowledge

To know more about the characteristics of a square.

Skills

Describe a square, Draw a square, select a square from other figures

Values

Having the culture of keen observation, think deeply and to beautify the environment using tessellation.

b) Prerequisites

Introduce the lesson by different activities on the different characteristics of a square learnt in P2.

c) Teaching and Learning resources

Manila paper, rulers, metre ruler, T-square, different pencils, paper and boxes.

d) Teaching and Learning Activities

- 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 11.1.1.1).
- 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 11.1.1.2, activity 11.1.1.3 and pair assessment 11.1.1;
- Invite some groups to present their findings and guide the whole class to harmonize the characteristics of a square.

Summary of topic taught

Guide pupils to summarize the characteristics of a square about sides, angles, diagonals and medians.

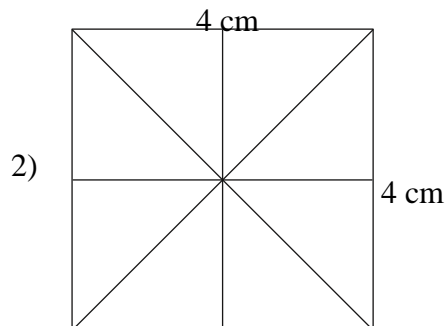
Assessment

Give pupils activities to do the exercises on page 236 about the characteristics of a square

e) Answers to activities

Answer for self-assessment 11.1.1

- 1) Diagram b is a square because all the four sides are equal



Answer for pair assessment 11.1.1

- 1) The answers differ depending on what the pupils find having the shapes of a square in their classroom.
- 2) The answers differ depending on how the pupil is able to make squares in boxes and he hangs it in the classroom

Answers of 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.

11.9.2 Lesson 2: Finding the perimeter of a square

a) Objectives

Knowledge

To understand how to find the perimeter of a square

Skills

To Determine and calculate the perimeter of a square.

Values

Having the culture of keen observation, think deeply and to beautify the environment using tessellation

b) Prerequisites /Introduction

Give pupils different activities on how to find the perimeter of a square as it was learnt in P2.

c) Teaching and Learning resources

Manila paper, rulers, meter ruler, T-square, different pencils, paper and boxes

d) Teaching and Learning activities

- Draw a square 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 square;
- Form groups pupils and guide them to do activity 11.1.2
- 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 square:

Perimeter = Side + side + side + side; The perimeter of a square equals four times of its side.

Or Perimeter = Side \times 4

Assessment:

Give pupils activities on how to find the perimeter of a square found in the pupils book: pair assessment 11.1.2 and **self assessment 11.1.2.**

e) **Answers to activities**

Answers for self-assessment 11.1.2

- | | |
|------------------------------------|------------------------------------|
| a) $cm\ 125 \times 4 = cm\ 500$ | c) $cm\ 602 \times 4 = cm\ 2\ 408$ |
| b) $cm\ 407 \times 4 = cm\ 1\ 628$ | d) $cm\ 765 \times 4 = cm\ 3\ 060$ |

Answers for paired assessment 11.1.2

- | | |
|--|----------------------------|
| 1) a) $cm\ 640 : 4 = cm\ 160$ | c) $cm\ 312 : 4 = cm\ 78$ |
| b) $cm\ 196 : 4 = cm\ 49$ | d) $cm\ 676 : 4 = cm\ 169$ |
| 2) Perimeter $m\ 80 \times 4 = m\ 320$ | |
| 3) Uruhande $m\ 1700 : 4 = m\ 425$ | |

Answers for application activity 11.1.2

- 1) Perimeter in cm is $145 \times 4 = cm\ 580$
- 2) Length of one side in m is $160 : 4 = 40\ m$
- a) Perimeter in cm is $25 \times 4 = 100\ cm$
- b) Perimeter in cm is $35 \times 4 = 140\ cm$

11.9.3 Lesson 3: Characteristics of a rectangle

a) Learning objective

Knowledge

To know more about the characteristics of a rectangle.

Skills

Describe a rectangle, Draw a rectangle, select a rectangle from other figures

Values

Having the culture of keen observation, think deeply and to beautify the environment using tessellation.

b) Prerequisites

Introduce the lesson by different activities on the different characteristics of a rectangle learnt in P2.

c) Teaching and Learning resources

Manila paper, rulers, mete ruler, T-square, different pencils, paper and boxes.

d) Teaching and Learning Activities

- 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 11.2.1.1).

- 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 11.2.1.2, activity 11.2.1.3 and pair assessment 11.2.1;
- Invite some groups to present their findings and guide the whole class to harmonize the characteristics of a rectangle.

Summary of topic taught

Guide pupils to summarize the characteristics of a rectangle about sides, angles, diagonals and medians.

Assessment

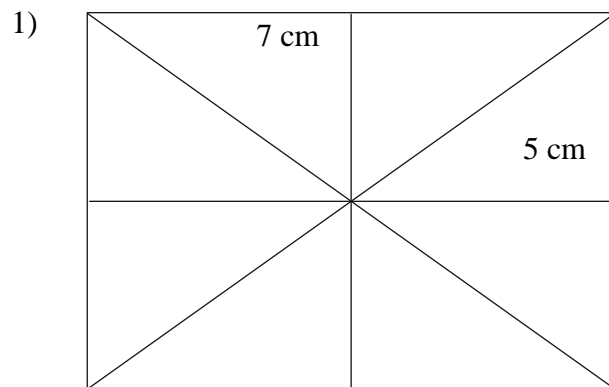
Give pupils activities to do about the characteristics of a rectangle: use pair assessment 11.2.1, self assessment 11.2.1 and application activity 11.2.1 and mark their works.

e) Answers to activities covered in this unit

Answers for paired assessment 11.2.1

- a) width c) length e) diagonal g) width
 b) diagonal d) median f) median h) half width

Self-assessment 11.2.1



- 2) 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.

11.9.4 Topic 4: Finding the perimeter of a rectangle

a) Objectives

Knowledge

To understand how to find the perimeter of a rectangle

Skills

To Determine and calculate the perimeter of a rectangle.

Values

Having the culture of keen observation, think deeply and to beautify the environment using tessellation

b) Prerequisites /Introduction

Give pupils different activities on how to find the perimeter of a rectangle as it was learnt in P2.

c) Teaching and Learning resources

Manila paper, rulers, meter ruler, T-square, different pencils, paper and boxes

d) Teaching and Learning activities

- Draw a rectangle 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 rectangle;
- Form groups of pupils and guide them to do activity 11.2.2
- 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 rectangle:

Perimeter = Side + side + side + side; Perimeter = **(Length + Width) x 2.**

Or **Perimeter = (L+W) x 2**

Assessment:

Give pupils activities on how to find the perimeter of a square found in the pupils book: pair assessment 11.2.2 and **self assessment 11.2.2.**

e) Answers to activities

Answers for pair assessment 11.2.2

- a) Perimeter: $(350 \text{ cm} + 100 \text{ cm}) \times 2 = 900 \text{ cm}$
- b) Perimeter: $(475 \text{ cm} + 215 \text{ cm}) \times 2 = 690 \text{ cm}$
- c) Perimeter: $(564 \text{ cm} + 245 \text{ cm}) \times 2 = 809 \text{ cm}$
- d) Perimeter: $(368 \text{ cm} + 162 \text{ cm}) \times 2 = 530 \text{ cm}$

Answers for self-assessment 11.2.2

- 1) Perimeter: $(570 \text{ m} + 450 \text{ m}) \times 2 = 2\,040 \text{ m}$
- 2) Perimeter: $(750 \text{ cm} + 250 \text{ cm}) \times 2 = 2\,000 \text{ cm}$

Answers for application activity 11.2.2

- 1)
 - a) Perimeter: $(124 \text{ cm} + 98 \text{ cm}) \times 2 = 444 \text{ cm}$
 - b) perimeter: $(259 \text{ cm} + 198 \text{ cm}) \times 2 = 914 \text{ cm}$
 - c) perimeter: $(412 \text{ cm} + 395 \text{ cm}) \times 2 = 1\,614 \text{ cm}$
 - d) perimeter: $(184 \text{ cm} + 139 \text{ cm}) \times 2 = 646 \text{ cm}$
- 2) perimeter: $(63 \text{ cm} + 39 \text{ cm}) \times 2 = 204 \text{ cm}$
- 3) perimeter: $(250 \text{ cm} + 150 \text{ cm}) \times 2 = 900 \text{ cm}$

11.9.5 Lesson 5: Characteristics of a triangle

a) Objectives

Knowledge

To know more about the characteristics of a triangle.

Skills

Describe a rectangle, Draw a triangle, select a triangle from other figures.

Values

Having the culture of keen observation, think deeply and to beautify the environment using tessellation.

b) Prerequisites

Introduce the lesson by different activities on the different characteristics of a triangle learnt in P2.

c) Teaching and Learning resources

Manila paper, rulers, mete ruler, T-square, different pencils, paper and boxes.

d) Teaching and Learning Activities

- 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 11.3.1.1).
- 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 activity 11.3.1.2, activity 11.3.1.3;
- 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 about sides, angles.

Assessment

Give pupils activities to do about the characteristics of a triangle and mark their works

11.9.6 Lesson 6: Types of triangles

a) Objectives

Knowledge

To know the different types of triangles

Skills

Differentiate types of triangles, draw and describe each type of triangle.

Values

Having the culture of keen observation, think deeply and to beautify the environment using tessellation.

b) Prerequisites /Introduction

Different activities on the characteristics of triangles learnt in P2.

c) Teaching and Learning resources

- Manila paper, rulers, meter, 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.

d) Teaching and Learning Activities

- Ask people 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 11.3.2.1a, Activity 11.3.2.2a, Activity 11.3.2.3a** and **Activity 11.3.2.4a**;
- 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 isosceles, equilateral, right angled triangle and any other triangle.

Assessment

Give pupils activities to be done in pairs, monitor and then support slow learners: use **Activity 11.3.2.1b, Activity 11.3.2.2b, Activity 11.3.2.3b, Activity 11.3.2.4b** and **Pair assessment 11.3.2.4**.

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. The self assessment 11.3.2.4 can serve as a homework for every pupil.

Answers for activities in this topic

Answers for paired assessment 11.3.2.4

- a) Isosceles triangle b) Equilateral Triangle
- c) Right angled triangle

Answers for self-assessment 11.3.2.4

- a) 180
- b) Three sides equal and three angles equal
- c) 60
- d) Isosceles
- e) Equilateral
- f) Two equal angles

11.9.7 Lesson 7: To find the perimeter of a triangle

a) Objectives

Knowledge

To understand how to find the perimeter of a triangle

Skills

To Determine and calculate the perimeter of a triangle.

Values

Having the culture of keen observation, think deeply and to beautify the environment using tessellation.

b) Prerequisites /Introduction

Give pupils different activities on how to find the perimeter of a triangle as it was learnt in P2.

c) Teaching and Learning resources

Manila paper, rulers, meter ruler, T-square, different pencils, paper and boxes

d) 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 11.3.3 and pair assessment 11.3.3;
- 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: **self assessment 11.3.3 and application activity 11.3.3.**

e) Answers to activities in this lesson

Answers for paired assesemt 11.3.3

- 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 self assessment 11.3.3

- 1) Perimeter: $97 \times \text{cm } 3 = 291 \text{ cm}$

Perimeter: $195 \times 3 \text{ cm} = 585 \text{ cm}$

Answers for application activity 11.3.3

- 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

11.9.8 Lesson 8: Characteristics of a circle

a) Objectives

Knowledge

To know the characteristics of a circle.

Skills

Describe a circle, draw a circle, interpret a circled figure or object.

Values

Having the culture of keen observation, think deeply and to beautify the environment using tessellation.

b) Prerequisites or introduction

Activities to observe and discover the characteristics of a circle.

c) Teaching and Learning resources

Manila paper, rulers, meter ruler, T-square, different pencils, paper and boxes

d) Teaching and Learning activities

- Use a pair of compasses, a protractor and a ruler to draw a circle and then ask pupils to take a careful 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 diameters and radius of the circle drawn on the blackboard (**activity 11.4.1**);

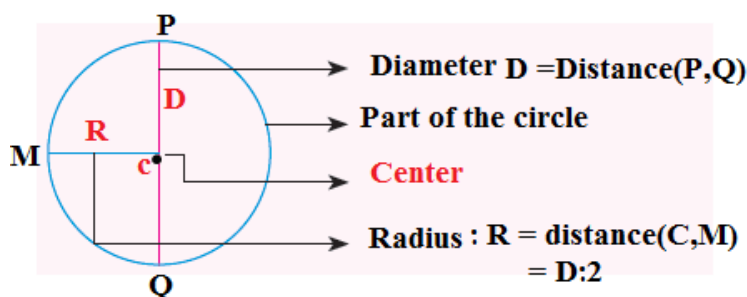
- Invite them to describe a circle basing on the diameters and radii they measured (**activity 11.4.2**);

- Form groups of pupils and assign them **activity 11.4.3**, **activity 11.4.4** and **pair assessment 11.4**

- 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 **self assessment 11.4** and **application activity 11.4** and mark them to verify whether the objectives were achieved.

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: $23 \text{ cm} + 19 \text{ cm} + 39 \text{ cm} = 81 \text{ cm}$

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

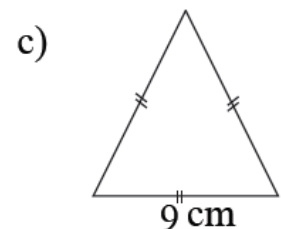
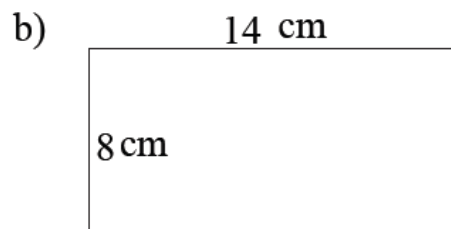
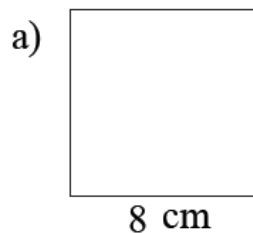
- b) 1) Diameter 4) Radius 7) Radius
 2) Radius 5) Radius 8) Radius
 3) cord 6) Radius 9) Diameter 10) Radius

11.10.4 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.

11.10.5 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.*
- **Financial education:** *This appears in activities 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 Generic competences to be developed

- Cooperation and interpersonal skills: *when a pupil works with others in groups or cooperates with other.*
- Communication skills: *when pupils explain their findings in front of others;*
- Problem solving skills: *when the pupil is able to locate objects on grids.*

12.5 New Words/concepts /terms

Posts: Vertical lines of a grid.

Crossing bars: Horizontal lines of a grid.

Locate: to show the position of an object on a grid.

Vertex: A point where two lines intersect forming an angle of a figure.

12.7 Guidance on the introductory activity 12

- The teacher guides the class to read a short story of a pupil who was selected to represent others in a drawing competition and he failed.
- The teacher invites the class to discuss the story and give views on what the pupil should have done.
- The teacher explains that the correct answers and explanations will be provided in this unit.

12.8 Guidance on how to support children with special educational needs

- Slow learners are provided with simple activities compared to the rest of the class as found in the teacher’s book.
- Those with physical disabilities: First determine what the disabilities are and prepare Teaching and Learning resources and activities to suit the needs of each learner.
- Quick/Fast learners: provide them with extension activities so that they don’t disrupt others.

12.9 List of sub-topics/lessons

UNIT 12: GRIDS			
	Lesson title	Learning objectives	Number of periods
0	Introductory activity	Arouse the curiosity of learners on the importance of grid.	1
2	Properties of a grid: Posts and crossing bars.	Describe properties of a grid : Post and crossing bar.	1
3	Locating a point on a grid	Locate a point on a grid .	2
4	Drawing a square on a grid.	Draw a square on a grid.	1
5	Drawing a rectangle on a grid.	Draw a rectangle on a grid.	1

6	Drawing a triangle on a grid.	Draw a triangle on a grid.	1
	Unit assessment	Draw grids, locate and put points or geometric figures on the grid according to its posts and crossing bars (coordinates).	1

12.9 Guidance on different lessons

12.9.1 Lesson 1: Properties of a grid

a) Objectives

Knowledge

To understand the properties of a grid

Skills

Differentiate posts from crossing bars.

Values

Having the culture of keen observation, think deeply and to explain the position of an object in space.

b) Prerequisites/Introduction

Different activities on the properties of a grid: number of vertical and horizontal lines.

c) Teaching and Learning resources

Manila paper, rulers, meter, T-square, different pencils, paper and boxes.

d) Teaching and Learning Activities

- Draw a grid and ask the pupils to look at it carefully and 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 properties (activity 12.1);
- 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), Numbering of vertical lines is done from left to right side, Numbering horizontal lines is done from down to up.

Assessment

Give pupils activity on how to make a grid

e) Answers for activities

Answers for Activity 12.1

It is made of 10 vertical lines and 10 horizontal lines.

11.9.2 Lesson 2: Locating a point on a grid

a) Objectives

Knowledge

To understand how to locate a point on a grid.

Skills

Locate a point on a grid.

Values

Having the culture of keen observation, think deeply and to explain the position of an object in space.

b) Prerequisites/Introduction

Different activities of locating points on a grid as it was learnt in P2.

c) Teaching and Learning resources

Manila paper, rulers, meter, T-square, different pencils, paper and boxes.

d) 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 the number of post and the number of crossing bars which form that point;

- Invite pupils to a whole class discussion where some groups present their answers by explaining why such a location of a 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 pair assessment 12.2 and the activity 12.2.2 and mark their works.

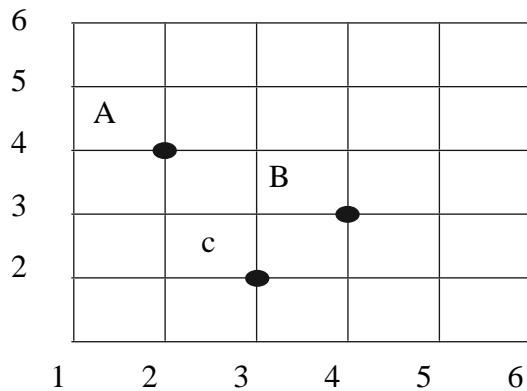
e) Answers to activities

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.

Answer for paired assessment 12.2



Answer for Activity 12.2.2

A (3,7) B (6,6) C. (3,5) D (4,3) E (6,2).

12.9.3 Lesson 3: Drawing shapes on a grid and location of vertices

a) Objectives

Knowledge

Explain the position of a figure on a grid.

Skills

Draw a figure on a grid, locate the figure on a grid.

Values

Develop the ability to put objects in their right places.

b) Prerequisites/Introduction

Different activities on how to locate points in a grid and then joining such points to make a figure.

c) Teaching and Learning resources

Manila paper, rulers, meter, T-square, different pencils, paper and boxes

d) 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 the pupils to look carefully at the grids and explain how each figure was drawn in the grid (**Activity 12.3.1.1, Activity 12.3.2.1 and Activity 12.3.3.1**);

- 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 figures on a grid: you first locate the vertices of the figure (points) and then match those points using a ruler in order to get the figure.

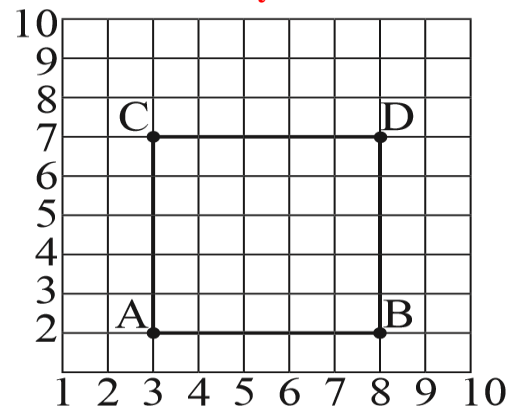
Assessment

Give pupils activities to be done: **Self assessment 12.3.1, Pair assessment 12.3.2, Self assessment 12.3.3, Pair assessment 12.3.3, Application activity 12.3.3 and Activity 12.3.3.3.**

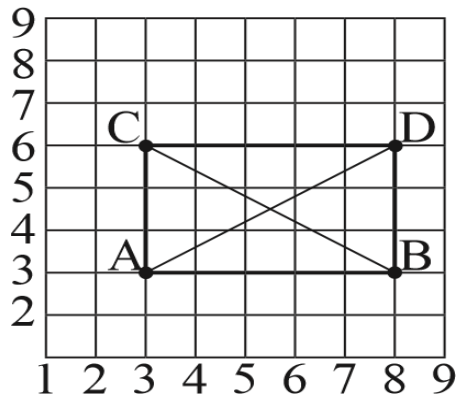
Guide each pupil to draw a grid and then ask them to draw any figure on the grid they have drawn.

e) Answers to activities

Answer for activity 12.3.1.2

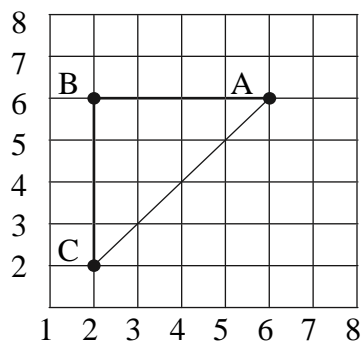


Answer for activity 12.3.2.2



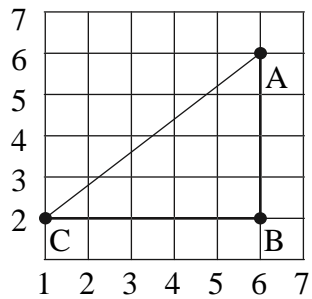
We see a picture of a rectangle and diagonals.

Answer for activity 12.3.3. 2



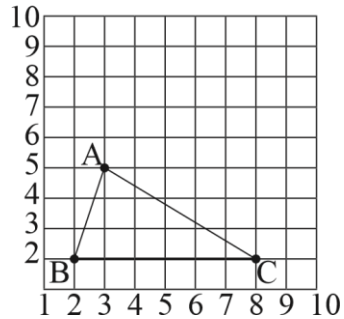
We see a right angled triangle

Answer for self assessment 12.3.3



We see a right angled triangle

Answer for pair assessment 12.3.3



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.

12.10 Ending points of the unit 12

12.10. 1 Summary of the content of the unit

As a teacher, you should have the summary on properties of a grid, Locating a point on a grid, And how to draw different figures on a grid by indicating their vertices.

12.10. 2 Additional information to the teacher

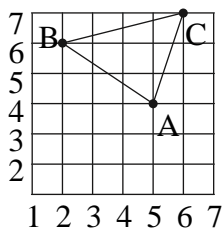
The teacher should be able to:

- guide all activities taking care of all the needs of the learners
- Explain clearly how to draw figures in a grid
- Prepare and use of different teaching and learning resources
- Incorporate cross cutting issues during the teaching of mathematics
- Teach mathematics based on a competence based curriculum
- Draw figures quickly in a grid
- Draw by hand and by the use of geometrical instruments.

12.10. 3 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

3. We have seen a triangle



12.10. 4 Remedial activity

Draw any square and a rectangle of your choice in a grid.

12.10. 5 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 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:** in doing exercises and activities without discrimination during teaching
- **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).

13.3 Generic competences to be developed

- Critical Thinking and being cautious while doing exercises *Problem solving: when applying the rules of counting carefully, counting all things in everyday life;*
- **Lifelong learning skills:** skills applied to find a missing number prompt the learner to have the desire to learn more.

Research: The learner needs to make more research on how to get the unknown number of things.

13.5 Key words

Equality: Equation showing two members with expressions which are equal.

13.6 Guidance on the introductory activity 13

- The teacher makes pupils read a short story of pupils who went into a competition and won but each one of them did not know the value of the prize received by each of them.
- The teacher invites the class to discuss the story and give views on what the pupils need to know in mathematics to discover the terms when you have the sum or a difference;
- The teacher arouse the curiosity of pupils that the correct answers and explanations will be provided in this unit.

13.7 Guidance on how to support pupils with special educational needs

- Slow learners are provided with simple activities compared to the rest of the class.
- Those with physical disabilities: First determine what the disabilities are and prepare Teaching and Learning resources and activities to suit the needs of each learner.

- Quick/Fast learners: provide them with activities found in the teachers book so that they don't disrupt others.

13.8 List of sub-topics/ lessons

UNIT 13: MISSING NUMBER IN ADDITION, SUBTRACTION, MULTIPLICATION AND DIVISION			16 periods
	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 addition	Find missing number in addition	1
3	Finding missing number in subtraction	Find missing number in subtraction	1
4	Finding missing number in multiplication	Find missing number in multiplication	1
5	Finding missing number in division	Find missing number in division	1
6	Equations involving addition	Be able to solve equations involving addition	1
7	Equations involving subtraction	Be able to solve equations involving subtraction	1
8	Equations involving multiplication	Be able to solve equations involving multiplication	1
9	Equations involving division	Be able to solve equations involving division	1
10	Finding the common difference in ascending (increasing) number pattern	Find the common difference in ascending (increasing) number pattern.	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
	Unit assessment	Find the missing number using rules of counting and to show rule that was used.	2

13.9 Guidance on different lessons

13.9.1 Lesson1: To find the missing number in addition and subtraction

a) Objectives

Knowledge

Understanding the rules applied to find the missing number in a number sentence with addition and subtraction.

Skills

Determine the missing number by quick addition or subtraction

Values

Thinking critically and quickly.

b) Prerequisites/Introduction

Different activities on how to find the missing number by quick addition or subtraction learnt in P2.

c) Teaching and Learning resources

Table of place value, abacus, multiplication tables and number cards in different colors.

d) Teaching and Learning Activities

- Guide pupils to find the missing number in a number sentence with addition or subtraction (see **Activity13.1and Activity13.2**);

- 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 **Pair assessment 13.1 and Pair assessment 13.2**;

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 rules to 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.

- To find the missing number in subtraction:
 - You subtract the difference from the bigger number in case the missing numbers are in the smaller number.
 - You add the difference and the bigger number in case the missing numbers are in the greater number.

Assessment

- Give pupils the **application activity** on how to find the missing number in addition and subtraction.
- 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 randomly, do the exercise on the piece of paper and explain how they did it.

e) Answers for activity

Activity 13.1

$$\begin{array}{r} \text{a) } 6\,307 \\ + 2\,442 \\ \hline 8\,749 \end{array}$$

$$\begin{array}{r} \text{b) } 5\,895 \\ + 2\,154 \\ \hline 8\,049 \end{array}$$

$$\begin{array}{r} \text{c) } 4\,387 \\ + 5\,511 \\ \hline 9\,848 \end{array}$$

Pair assessment 13.1

$$\begin{array}{r} \text{a) } 7\,684 \\ + 1\,112 \\ \hline 8\,796 \end{array}$$

$$\begin{array}{r} \text{b) } 2\,443 \\ + 1\,316 \\ \hline 3\,759 \end{array}$$

$$\begin{array}{r} \text{c) } 4\,367 \\ + 3\,431 \\ \hline 6\,798 \end{array}$$

Self assessment 13.1

$$\begin{array}{r} \text{a) } 5\,624 \\ + 4\,121 \\ \hline 9\,745 \end{array}$$

$$\begin{array}{r} \text{b) } 2\,467 \\ + 4\,331 \\ \hline 6\,798 \end{array}$$

$$\begin{array}{r} \text{c) } 3\,456 \\ + 4\,523 \\ \hline 7\,979 \end{array}$$

Activity 13.2

$$\begin{array}{r} \text{a) } 9\ 562 \\ - 8\ 132 \\ \hline 1\ 430 \end{array}$$

$$\begin{array}{r} \text{b) } 4\ 321 \\ - 2\ 120 \\ \hline 2\ 201 \end{array}$$

$$\begin{array}{r} \text{c) } 7\ 767 \\ - 3\ 445 \\ \hline 4\ 322 \end{array}$$

Pair assessment 13.2

$$\begin{array}{r} \text{a) } 2\ 130 \\ - 1\ 120 \\ \hline 1\ 010 \end{array}$$

$$\begin{array}{r} \text{b) } 6\ 621 \\ - 3\ 420 \\ \hline 2\ 201 \end{array}$$

$$\begin{array}{r} \text{c) } 5\ 456 \\ - 4\ 211 \\ \hline 1\ 245 \end{array}$$

Self assessment 13.2

$$\begin{array}{r} \text{a) } 5\ 9\ 5\ 6 \\ - 1\ 3\ 2\ 1 \\ \hline 4\ 6\ 3\ 5 \end{array}$$

$$\begin{array}{r} \text{b) } 4\ 597 \\ - 1\ 382 \\ \hline 3\ 215 \end{array}$$

$$\begin{array}{r} \text{c) } 5\ 974 \\ - 1\ 653 \\ \hline 4\ 321 \end{array}$$

Application activity 13.2

$$\begin{array}{r} \text{a) } 6\ 694 \\ - 1\ 374 \\ \hline 5\ 320 \end{array}$$

$$\begin{array}{r} \text{b) } 2\ 799 \\ - 1\ 259 \\ \hline 1\ 540 \end{array}$$

$$\begin{array}{r} \text{c) } 3\ 772 \\ - 1\ 452 \\ \hline 2\ 321 \end{array}$$

13.9.2 Lesson 2: To find the missing number in multiplication and division

a) Objectives

Knowledge

Understanding the rules applied to find the missing number in a number sentence with multiplication and division.

Skills

Determine the missing number by quick multiplication or division

Values

Thinking critically and quickly.

b) Prerequisites/Introduction

Different activities on how to find the missing number by quick multiplication or division learnt in P2.

c) Teaching and Learning resources

Table of place value, abacus, multiplication tables and number cards in different colors.

d) Teaching and Learning Activities

- Guide pupils to find the missing number in a number sentence with multiplication or division (see **Activity 13.3** and **Activity 13.4**);

- Invite learners to discover the rule applied when finding the missing number in the expression with multiplication or division;

- Form groups and ask pupils to do **Pair assessment 13.3** and **Pair assessment 13.4**;

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 rules to follow in finding the missing number:

- To find the missing number in multiplication, you divide the product by multiplicand.
- 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.

- 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 randomly, do the exercise on the piece of paper and explain how they did it.

d) Answers for activities

Activity 13.3

a) $4 \times 250 = 1\,000$

c) $945 \times 7 = 6\,615$

e) $8 \times 789 = 6\,312$

b) $1\,610 \times 5 = 8\,050$

d) $564 \times 9 = 5\,076$

f) $6 \times 987 = 5\,922$

Pair assessment 13.3

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) $\begin{array}{r} 451 \\ \times 9 \\ \hline 459 \end{array}$
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Self-assessment 13.3

a) $\begin{array}{r} 684 \\ \times 7 \\ \hline 4\ 788 \end{array}$	b. $\begin{array}{r} 492 \\ \times 6 \\ \hline 2\ 952 \end{array}$	c) $\begin{array}{r} 1\ 956 \\ \times 5 \\ \hline 9\ 780 \end{array}$
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Application activity 13.3

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) $\begin{array}{r} 4\ 897 \\ \times 2 \\ \hline 9\ 794 \end{array}$
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Activity 13.4

a) $70 : 5 = 350$ d) $147 : 21 = 7$ g) $9\ 672 : 3\ 224 = 3$
 b) $360 : 90 = 4$ e) $15 : 6 = 90$ h) $9\ 819 : 1\ 091 = 9$
 c) $15 : 8 = 120$ f) $225 : 75 = 3$ i) $5\ 274 : 586 = 9$

Pair assessment 13.4

a) $648 : 81 = 8$ b) $729 : 81 = 9$ c) $847 : 121 = 7$

Self-assessment 13.4

a) $270 : 6 = 45$ b) $445 : 5 = 89$ c) $500 : 4 = 125$

Application activity 13.4

a) $8\ 795 : 1759 = 5$ b) $7\ 362 : 9 = 818$ c) $9\ 672 : 1\ 598 = 6$

13.9.3 Lesson 3: Concept of equality of two members with addition and subtraction

a) Objectives

Knowledge

To understand the concept of equality.

Skills

To find a missing number in an equality.

Values

Thinking critically and quickly

b) Prerequisite/Introduction

Different activities on how to find the missing number in addition and subtraction learnt in previous lessons.

c) Teaching and Learning resources

Table of place values, abacus, number cards, manila paper.

d) 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 13.5.1.1**);
- form groups and ask pupils to do activities on equality involving addition (**activity 13.5.1.2**);
- Invite the whole class discussion and harmonize groups' findings

Summary

Guide pupils to summarize the rules to follow when finding a missing number: add two numbers of the other member and you subtract the remaining number from the sum you got.

$$100 + 25 = 90 + \bullet \quad \longrightarrow \quad (100 + 25) - 90 = 35$$

Assessment

Give pupils exercises found on pages 268, 270, 271 and 272 in the pupils book on how to find a missing number in an equality

Answer for Activity 13.5.1.2

- | | |
|--------------------------|---------------------------|
| a) $80 + 30 = 50 + 60$ | c) $265 + 35 = 250 + 50$ |
| b) $150 + 95 = 200 + 45$ | d) $479 + 51 = 350 + 180$ |

Answer for Pair assessment 13.5.1

- | | |
|----------------------------|----------------------------|
| a) $913 + 97 = 803 + 207$ | c) $909 + 597 = 987 + 519$ |
| b) $495 + 575 = 195 + 875$ | d) $825 + 795 = 962 + 658$ |

Answer for Self assessment 15.5.1

- | | |
|-------------------------------|-------------------------------------|
| a) $875 + 840 = 1\,256 + 459$ | b) $3\,020 + 1\,575 = 2\,145 + 875$ |
|-------------------------------|-------------------------------------|

$$c) \quad 654 + 746 = 213 + 598$$

$$d) \quad 1\,208 + 726 = 576 + 1\,358$$

Answer for Application activity 13.5.1

$$1\,758 + 722 = 1\,526 + 954 \quad c) \quad 1\,546 + 647 = 1\,208 + 985$$

$$a) \quad 398 + 575 = 215 + 758$$

$$d) \quad 2\,801 + 1\,267 = 2\,567 + 1\,501$$

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 13.5.2**);

- Form groups and ask pupils to do activities on equality involving subtraction (**Activity 13.5.2** and **Pair assessment 13.5.2**);

- Invite the whole class discussion and harmonize groups' findings.

Summary

- Guide pupils to summarize the rules to 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.

$$\bullet - 95 = 180 - 25 \quad \longrightarrow \quad (180 - 25) + 95 = 250$$

- When the missing number is a subtrahend, find the other difference and you subtract their difference from the remaining number of second member.

$$145 - \bullet = 175 - 65 \quad \longrightarrow \quad 175 - 65 = 110$$

$$\longrightarrow \quad 145 - 110 = 35$$

Assessment

Give pupils **Self assessment 13.5.2** and application activity 13.5.2 and mark pupils' works.

Answers for activities

Answer for activity 13.5.2

$$a) \quad 235 - 45 = 540 - 350$$

$$c) \quad 430 - 180 = 320 - 70$$

$$b) \quad 725 - 135 = 600 - 10$$

$$d) \quad 978 - 435 = 763 - 220$$

Answer for Pair assessment 13.5.2

$$a) \quad 685 - 175 = 1\,380 - 870$$

$$c) \quad 1\,037 - 459 = 897 - 319$$

$$b) \quad 185 - 75 = 485 - 375$$

$$d) \quad 1\,765 - 975 = 1\,785 - 995$$

Answer for Self assessment 13.5.2

- a) $456 - 190 = 564 - 298$ c) $667 - 345 = 856 - 534$
 b) $975 - 686 = 721 - 432$ d) $768 - 548 = 729 - 509$

Answer for application activity 13.5.2

- a) $765 - 348 = 622 - 205$ c) $1\ 567 - 1\ 198 = 2\ 018 - 1\ 649$
 b) $1\ 234 - 978 = 981 - 725$ d) $1\ 453 - 832 = 1\ 519 - 898$

13.9.4 Lesson 4: Concept of equality of two members with multiplication and division

a) Objectives

Knowledge

To understand the concept of equality.

Skills

To find a missing number in an equality.

Values

Thinking critically and quickly

b) Prerequisite/Introduction

Different activities on how to find the missing number in multiplication and division learnt in previous lessons.

c) Teaching and Learning resources

Table of place values, abacus, number cards, manila paper.

d) 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 **activity 13.5.3.1**);
- form groups and ask pupils to do activities on equality involving multiplication (**Activity 13.5.3.2 and Pair assessment 13.5.3**);
- Invite the whole class discussion and harmonize groups' findings.

Summary

Guide pupils to summarize the rules to 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.

$$6 \times 5 = \cdot \times 3 \longrightarrow 6 \times 5 = 30 \longrightarrow 30 : 3 = 10$$

Assessment

Give pupils Self assessment 13.5.3 and 272 Application activity 15.5.3 and mark their work.

Answers for activities

Activity 13.5.3.2

- | | |
|--------------------------------|---------------------------------|
| a) $9 \times 18 = 6 \times 27$ | c) $21 \times 7 = 49 \times 3$ |
| b) $36 \times 4 = 9 \times 16$ | d) $120 \times 5 = 75 \times 8$ |

Pair assessment 13.5.3

- | | |
|--------------------------------|---------------------------------|
| a) $5 \times 40 = 25 \times 8$ | c) $88 \times 5 = 110 \times 4$ |
| b) $9 \times 24 = 72 \times 3$ | d) $98 \times 6 = 196 \times 3$ |

Self assessment 13.5.3

- | | |
|---------------------------------|----------------------------------|
| a) $25 \times 8 = 100 \times 2$ | c) $125 \times 4 = 100 \times 5$ |
| b) $45 \times 8 = 6 \times 60$ | d) $135 \times 9 = 27 \times 45$ |

Application activity 15.5.3

- | | |
|--------------------------------------|--------------------------------------|
| a) $420 \times 7 = 35 \times 84$ | c) $3 \times 228 = 76 \times 9$ |
| b) $105 \times 89 = 5 \times 1\,869$ | d) $5 \times 1\,794 = 138 \times 65$ |

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 **activity 13.5.4.1**);
- Form groups and ask pupils to do activities on equality involving division (**Activity 13.5.4.2 and Pair assessment 13.5.4**);
- Invite the whole class discussion and harmonize groups' findings.

Summary

Guide pupils to summarize the rules to 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 second member.

$$\bullet : 5 = 225 : 3 \longrightarrow 225 : 3 = 75 \longrightarrow 75 \times 5 = 375$$

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.

$$120 : \bullet = 45 : 9 \longrightarrow 45 : 9 = 5 \longrightarrow 120 : 5 = 24$$

Assessment

Give pupils Self assessment 13.5.3 and 272 Application activity 15.5.3 and mark their work.

Answers for activities

Activity 13.5.4.2

a) $824 : 8 = 412 : 4$

c) $945 : 9 = 315 : 3$

b) $4536 : 9 = 2016 : 4$

d) $2828 : 7 = 2020 : 5$

Pair assessment 13.5.4

a) $636 : 6 = 212 : 2$

c) $90 : 9 = 100 : 10$

b) $81 : 9 = 72 : 8$

d) $546 : 6 = 455 : 5$

Self assessment 13.5.4

a) $808 : 8 = 404 : 4$

c) $918 : 9 = 306 : 3$

b) $581 : 7 = 498 : 6$

d) $620 : 5 = 992 : 8$

Application activity 13.5.4

a) $2925 : 9 = 1950 : 6$

c) $2464 : 8 = 2772 : 9$

b) $872 : 8 = 436 : 4$

d) $12 : 4 = 9 : 3$

13.9.5 Lesson 5: Finding the missing number in a number pattern

a) Objectives

Knowledge

To explain how to find the missing number of a number pattern

Skills

To find a missing number in any a number pattern

Values

Thinking critically and quickly

b) Prerequisite/Introduction

Different activities on how to find the common difference and terms of a number pattern.

c) Teaching and Learning resources

Multiplication table, abacus, number cards, manila paper.

d) Teaching and Learning Activities

- Guide pupils to do activities on how to find the common difference of a given number pattern (**Activity 13.6.1 or Activity 13.6.2.1**)
 - Guide pupils to use the common difference and complete other terms of that number pattern;
 - Form groups and ask pupils to do activities of finding the missing number in a number patter by use of its common difference (**Activity 13.6.3.1 and Activity 13.6.3.2**);
 - Invite the whole class discussion and harmonize groups' findings.

Summary

- Guide pupils to summarize the rules to follow when finding a missing number of a number pattern: You first calculate the common difference between numbers, You make addition in order to find the missing terms of an ascending number pattern, then You make subtraction in order to find the missing terms of a descending number pattern .
- **Assessment**

Give pupils self assessment 13.6.3 and application activity 13.6.3 and mark their work.

e) Answers for activities

Common difference in ascending (increasing) number pattern

Activity 13.6.1

- a) 855, 1 355, 1 855, 2 355 Common difference is $1\ 355 - 855 = 500$
b) 205, 505, 805, 1105 Common difference is $505 - 205 = 300$

Pair assessment 13.6.1

- a) 1 005, 1 075, 1 145 Common difference is $1075 - 1\ 005 = 70$
b) 239, 300, 361, 422 Common difference is $300 - 239 = 61$
c) 415, 600, 785, 870 |Common difference is $600 - 415 = 185$

Self assessment 13.6.1

- a) 295, 333, 371, 409 Common difference is $333 - 295 = 38$

b) 178, 299, 420, 441 Common difference is $299 - 178 = 121$

Application activity 13.6.1

a) 397, 630, 863, 1096 Common difference is $630 - 397 = 233$

b) 524, 700, 876, 1052 Common difference is $700 - 524 = 176$

Common difference in a descending (decreasing) number pattern

Activity 13.6.2.2

a) 2 456, 2 306, 2 156, 2 006 Common difference is $2 456 - 2 306 = 150$

c) 4 032, 3 957, 3 882, 3 807 Common difference is $4 032 - 3 957 = 75$

b) 1 890, 1 751, 1 612, 1 473 Common difference is $1 890 - 1 751 = 214$

d) 2 476, 3 000, 3 524, 4 048 Common difference is $3 000 - 2 476 = 524$

Pair assessment 13.6.2

a) 2 018, 1 653, 1 288, 923 Common difference is $2 018 - 1 653 = 365$

b) 956, 878, 800, 722 Common difference is $956 - 878 = 78$

Self assessment 13.6.2

a) 756, 641, 526, 411 Common difference is $756 - 641 = 115$

b) 1 879, 1 811, 1 743, 1 675 Common difference is $1 879 - 1 811 = 68$

Application activity 13.6.2

a) 1 519, 1 470, 1 421, 1 372 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 $789 - 691 = 98$

Finding the missing number in a number pattern

Activity 13.6.3.2

a) 3 456, 3 567, 3 678, 3 789, 3 900, 4 011 Common difference is $3 567 - 3 456 = 111$

b) 4 256, 4 365, 4 474, 4 583, 4 692, 4 801 Common difference is $4 365 - 4 256 = 109$

c) 1 994, 2 018, 2 042, 2 066, 2 090, 2 114 Common difference is $2 018 - 1 994 = 24$

Pair assessment 13.6.3

1 897, 1 950, 2 003, 2 056, 2 109, 2 162 Common difference is $1\ 950 - 1\ 897 = 53$

a) 7 564, 6 614, 5 664, 4 714, 3 764, 2 814 Common difference is $7\ 564 - 6\ 614 = 950$

Self assessment 13.6.3

a) 4 000, 4 500, 5 000, 5 500, 6 000, 6 500 Common difference is $4\ 500 - 4\ 000 = 500$

b) 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 $4\ 325 - 3\ 875 = 450$

13.10 Ending points of the Unit 13

13.10.1 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.

13.10.2 Additional information for the teacher

The teacher should be able to:

- guide all activities taking care of all the needs of the learners;
- Explain clearly the rules for finding missing numbers in addition, subtraction, multiplication and division;
- Find the missing number starting with equality;
- Prepare and use of different teaching and learning resources;
- Incorporate cross cutting issues during the teaching of mathematics;
- Solve simple equations involving addition, subtraction, multiplication or division;
- refer to methods of solving simple equation to understand the ways of finding the missing number mathematical expressions exploited above.

13.10.3 Answers for the end unit assessment 13

1) Find the missing number

a)	$\begin{array}{r} 1787 \\ + 6112 \\ \hline 7899 \end{array}$	d)	$\begin{array}{r} 158 \\ \times 8 \\ \hline 1264 \end{array}$	g)	$\begin{array}{r} 2987 \\ - 1376 \\ \hline 1611 \end{array}$
b)	$\begin{array}{r} 243 \\ \times 9 \\ \hline 2187 \end{array}$	e)	$\begin{array}{r} 7956 \\ - 1534 \\ \hline 6422 \end{array}$	h)	$3612 : 4 = 903$
c)	$\begin{array}{r} 4355 \\ + 3941 \\ \hline 8296 \end{array}$	f)	$\begin{array}{r} 179 \\ \times 6 \\ \hline 1074 \end{array}$	i)	$1575 : 5 = 315$
				j)	$1678 : 2 = 839$
				k)	$1326 : 6 = 221$

2) Fill these equalities with the missing number

a) $100 + 50 = 80 + 70$	d) $9 \times 8 = 18 \times 4$
b) $525 - 200 = 400 - 75$	e) $25 \times 2 = 10 \times 5$
c) $978 - 435 = 763 - 220$	f) $728 : 8 = 364 : 4$

3) Find the common difference in these sequences:

a) 19 b) 255 c) 79 d) 36 e) 63 f) 24

4) Fill the missing numbers in the sequence:

a) 1250, 1750, ..., ... b) 3400, 3100, ..., ... c) 2525, 5025

13.10.4 Remedial activities

Find the missing number

a)	$\begin{array}{r} 2 \cdot \cdot \cdot 0 \\ + 142 \\ \hline 2842 \end{array}$	b)	$\begin{array}{r} 3568 \\ - \cdot \cdot \cdot \cdot \\ \hline 1457 \end{array}$	c)	$\begin{array}{r} 3568 \\ \times 3 \\ \hline \cdot \cdot \cdot \cdot \end{array}$	d)	$842 : \cdot = 421$
----	--	----	---	----	---	----	---------------------

Answers:

a)	$\begin{array}{r} 2700 \\ + 142 \\ \hline 2842 \end{array}$	b)	$\begin{array}{r} 3568 \\ - 2111 \\ \hline 1457 \end{array}$	c)	$\begin{array}{r} 3568 \\ \times 3 \\ \hline 6633 \end{array}$	d)	$842 : 2 = 421$
----	---	----	--	----	--	----	-----------------

13.10.5 Extended activities

1) find the missing number

$$\begin{array}{r} \text{a) } \quad 9 \cdot 15 \\ + 3 \cdot 6 \\ \hline 9801 \end{array} \qquad \begin{array}{r} \text{e) } \quad 9 \cdot 15 \\ - \cdot 3 \cdot 4 \\ \hline 1221 \end{array}$$

b) $975 + 899 = \cdot + 926$

c) $148 \times 7 = \cdot \times 4$

d) $864 : 8 = \cdot : 6$

2) Fill in the missing numbers in the number pattern

a) $7\ 535, 7\ 405, 7\ 365, \dots, \dots$

b) $9\ 876, 9\ 444, \dots, \dots$

Answers

$$\begin{array}{r} \text{a) } \quad 9415 \\ + 386 \\ \hline 9801 \end{array} \qquad \begin{array}{r} \text{b) } \quad 9615 \\ - 8394 \\ \hline 1221 \end{array}$$

b) $975 + 899 = 948 + 926$

c) $148 \times 7 = 259 \times 4$

d) $864 : 8 = 648 : 6$

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

Provide activities for 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;

- *Financial education:* when using different resources to make a grid without damaging or wasting them, when dealing with coins on a grid and discuss the proper use of money.

14.4 Generic competence to be developed

- Cooperation and interpersonal relations: when a pupil works in groups or cooperates with others;
- *Communication: Use of correct terms and words when explaining to others the points of view and when presenting findings to the whole class;*

14.5 Key words

Amount: the number of things

Analyze: provide all the information that can be obtained from observing a pictograph.

14.6 Guidance on the introductory activity 14

- The teacher makes pupils read a short story of pupils who visited the institute of statistics but could not understand the pictures used to find the exact number and types of cars that were recorded.
- The teacher invites the class to discuss the story and give views on what the pictographs teach them in mathematics and asks them to discuss how pictographs are made, how to put objects on pictographs and how to interpret them.
- The teacher arouse the curiosity of pupils by telling that the correct answers and explanations will be provided in this unit.

14.7 Guidance on how to support pupils with special educational needs

- Slow learners are provided with simple activities compared to the rest of the class;
- Those with physical disabilities: First determine what the disabilities are and prepare teaching and learning resources and activities to suit the needs of each learner.
- Quick/Fast learners: Provide them with extension activities so that they are busy and don't disrupt others.

14.8 List of sub-topics/lessons of this unit

UNIT 14 :ANALYZE AND DESCRIBE THE INFORMATION READ ON A PICTOGRAPH			8 Periods
	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	1

		pictograph.	
3	Representation of objects on a pictograph	Represent objects on a pictograph.	1
4	Finding the number of objects on a pictograph	Find the number of objects on a pictograph.	2
5	Drawing a pictograph with the given information or objects	Draw a pictograph with the given information or objects.	2
	Unit assessment	Analyze and describe the information read on a pictograph	1

14.9 Guidance on the teaching of different lessons

14.9.1 Lesson 1: Reading the number of objects on a pictograph

a) Objectives

Knowledge

To explain how objects are put on a pictograph

Skills

To read and differentiate objects that are represented on a pictograph.

Values

Thinking critically and quickly

b) Prerequisite/Introduction

Activities for describing and interpreting various pictographs showing the number of objects as it was learnt in P2.

c) Teaching and Learning resources

Different types of counters with different colors, manila paper, etc.

d) Teaching and Learning Activities

- 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**);
 - Guide pupils to recall how objects are arranged on a pictograph (vertically and horizontally);
- Form groups and ask pupils to do activities of describing a pictograph (**Activity 14.1.2**);
- Invite the whole class discussion and harmonize groups' findings.

Summary

- Guide pupils to summarize how objects are arranged on a pictograph and how to get information from it:
 - Each column has same type of objects,
 - different columns have different types of objects;
 - the number of each type is counted vertically in each column,
 - the types of objects are counted horizontally and their number equals to the number of columns.
- **Assessment**

Give pupils **Activity 14.1.2** and mark their work.

14.9.2 Lesson 2: Representation of objects on a pictograph

a) Objectives

Knowledge

To know how to put given objects on a pictograph

Skills

Organizing objects on a pictograph.

Values

Thinking critically and quickly and Being analytical.

b) Prerequisites/Introduction

Activities related to the interpretation of a pictograph learnt in P2 and in the previous lesson;

c) Teaching and Learning resources

Manila paper, different counters with different colors.

d) 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** 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 on a squared manila paper put on the table or the floor;
- 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 rules followed in making a pictograph (see the previous lesson)

Assessment

- Make small pieces of paper with pictographs, putting them in a box and asking each pupil to pick one paper randomly, explaining the number/amount of things that appear in the pictograph.

14.9.3 Lesson 3: Description of various pictographs

This lesson is related to the application activities of the previous lesson (see the step of assessment). You can use **activity 14.3**.

14.9.4 Lesson 4: Making a pictograph with the given information or objects

a) Objectives

Knowledge

To know how to put given objects on a pictograph

Skills

Organize objects to be put on a pictograph, Draw a pictograph with organized objects.

Values

Thinking critically and quickly and Being analytical.

b) Prerequisites/Introduction

Activities related to the interpretation of a pictograph learnt in P2 and in the previous lessons;

c) Teaching and Learning resources

Manila paper, different counters with different colors.

d) Teaching and Learning Activities

- Guide pupils to recall how objects are arranged on a pictograph;
- Form groups of pupils and assign them **Activity 14.4.1** 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 rules followed in making a pictograph (see the previous lessons):

- Each column has same type of objects,
- different columns have different types of objects;
- the number of each type is counted vertically in each column,
- the types of objects are counted horizontally and their number equals to the number of columns.

Assessment

Give pupils **activity 14.4.2** to be done in pairs and mark their work.

Note:

If you do not have counters of the types found in activity 14.4.1 and activity 14.4.2, you can give them other counters or guide pupils how to use counters' names for example dog 1, dog 2, dog 3, dog 4 in activity 14.4.1 and shirt 1, shirt 2 in the activity 14.4.2.

Answers to activities

Activity 14.1.1

- 8 Pawpaw - 9 Bananas - Carrots -10 Apples
- 7 Pumpkins - 6 Cabbages - 5 Tomatoes

Activity 14.1.2

- 6 small combs - 8 small jugs
- 9 small brushes - 7 small pumpkins
- 12 pineapples - 10 avocados
- 11 eggs

Activity 14.3

- A) - 4 yellow shirts - 7 dresses
 - 6 green shirts - 5 pairs of trousers
 - 4 skirts - 3 paint brushes
 - 8 raincoats
- B) 5 goats, 3 drinks, 6 bees, 2 crocodiles 7 cockroaches, 4 butterflies, 9 dogs.

14.10 Ending points of unit 14

14.10.1 Summary of the unit content

The teacher should have the summary on how to analyze and explain the information provided by a pictograph.





























14.10.2 Additional information to the teacher

The teacher should be able to:

- Guide all activities taking care of all the needs of the learners;
- Explain clearly the different types of pictographs especially their use in everyday life;
- Prepare and use of different teaching and learning resources;
- Incorporate cross cutting issues during the teaching of mathematics;
- Teach mathematics based on a competence based curriculum
- Analyze information provided by different pictographs;
- Use pictographs using a computer.

14.10.3 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							

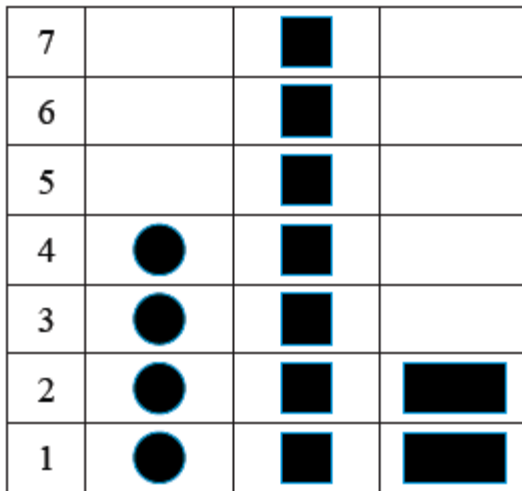
This pictograph contains:

- 3 coins of 100 Frw
- 7 Tape of length measurement

- 6 bicycles
- 5 weighing scales
- 2 wall clocks
- 1 roll
- 4 coke drinks

14.10.4 Remedial activities

Use a grid to draw 4 circles, 7 squares and 2 rectangles



14.10.5 Extension activities

Use a pictograph to draw

- a) 4 cows, 5 rats, 7 chickens, 8 dogs
- b) 3 bananas, 6 oranges, 9 pineapples

15. ANSWERS FOR THE END YEAR ASSESSMENT

A. Whole 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) $3\ 987 + 5\ 765 = 9\ 752$
b) $4\ 678 + 5\ 099 = 9\ 777$
8. a) $9\ 123 - 7\ 987 = 1\ 136$ b) $8\ 005 - 5\ 678 = 2\ 327$
9. a) $82 \times 65 = 5\ 330$ b) $154 \times 45 = 6\ 930$ c) $256 \times 38 = 9\ 728$
10. a) $7896 : 4 = 1974$ b) $8469 : 9 = 941$ c) $9891 : 7 = 1413$

$$\begin{array}{r}
 7896 \overline{) 4} \\
 \underline{-4} \\
 38 \\
 \underline{-36} \\
 029 \\
 \underline{-28} \\
 016 \\
 \underline{-16} \\
 0
 \end{array}$$

$$\begin{array}{r}
 8469 \overline{) 9} \\
 \underline{-81} \\
 036 \\
 \underline{-36} \\
 09 \\
 \underline{-9} \\
 0
 \end{array}$$

$$\begin{array}{r}
 9891 \overline{) 7} \\
 \underline{-7} \\
 28 \\
 \underline{-28} \\
 009 \\
 \underline{-7} \\
 21 \\
 \underline{-21} \\
 0
 \end{array}$$

11. a) $4\ 198 + 5\ 678 = 9\ 876$ e) $4\ 567 + 3\ 578 = 2159 + 5\ 986$
b) $8 \times 789 = 6\ 312$ f) $6\ 754 - 4\ 629 = 7\ 523 - 5\ 398$
c) $8\ 567 - 5\ 778 = 2\ 789$ g) $564 \times 8 = 9 \times 448$
d) $9\ 785 : 1\ 957 = 5$ h) $4\ 375 : 5 = 7\ 000 : 8$

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

√	0	1	2	3	4	5	6	7	8	9	10
× 7	0	7	14	21	28	35	42	49	56	63	70
√	0	1	2	3	4	5	6	7	8	9	10
× 8	0	8	16	24	32	40	48	56	64	72	80
√	0	1	2	3	4	5	6	7	8	9	10
× 9	0	9	18	27	36	45	54	63	72	81	90

15)

- Those who will receive mosquito nets u 9 875: 5 = 1 975
- The total population of Bibare Cell: 1 368 + 1 579 + 6 487= 9 434.
- Those that did not grow 8 764 – 7 985= 779
- Number of people who fit it : 1 009 × 9 = 9 081

B. Measurements

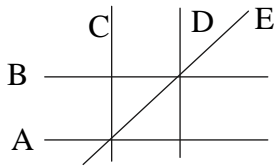
- Meter (m)
 - Kilogram (kg)
 - Liter
- 5kg 80g = 508dag
 - 8 l 30cl = 83dl
 - 5m 9cm = 5 090 mm
- 225cl × 8 = 18 l
 - 8km 50dam x 6 = 510hm
 - 578dag × 5 = 289hg
 - 7200cl : 9 = 180
 - km 8 m 4 : 6 = m 1334
 - 7 kg 7dag : 7 = 1010g
 - 80dl + 120ml = 2 l
 - 75hm + 2250dam = 3km
 - 59hg 8g + 286dag = 8 760 g
 - 9hm 8 m– 49dam 9m = 409m
 - 68 dl– 3800ml = 3 l
 - 6kg 8dag – 5678g = 402g
- 9 000 Frw = 2 000 Frw + 5 000 Frw + 2 000 Frw
 - 5 000 Frw + 500 Frw + 200 Frw = 5 700 Frw
 - I would pay 1 200 Frw + 900 + 400 Frw + 950 Frw + 800 Frw + F 1 500 Frw = F 5 750 Frw

The balance would be= 10 000 Frw – 5750 Frw = 4250 Frw
- 6 pm
 - 08:45 am
 - 11:30 am
- 4 years have 208 months
 - 8 weeks equal to 56 days
 - 30 days equal 720 hours
 - 35 days are equal to 5 weeks
- 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

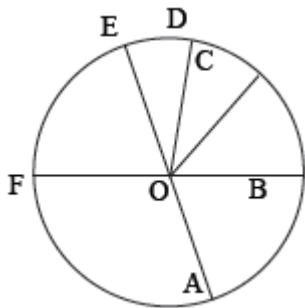
B. Rectangle		
Length	Width	Perimeter
75 cm	54 cm	258 cm
23 cm	17 cm	80 cm
56 cm	43 cm	198 cm
87 cm	67 cm	308 cm
93 cm	79 cm	344 cm
36 cm	25 cm	122 cm

154 cm	616 cm
--------	--------

69 cm	47 cm	232
-------	-------	-----

- 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

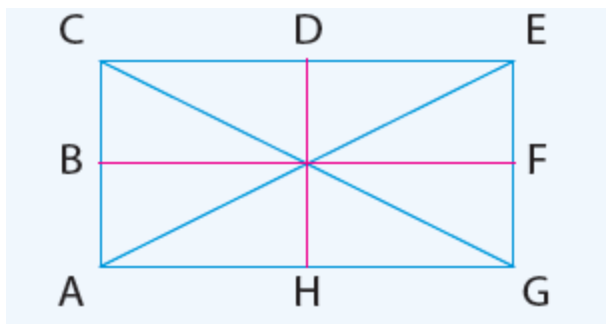
5) Perimeter is $45 \text{ cm} \times 4 = 180 \text{ cm}$

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

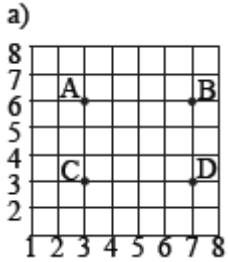


- a) AC is width e) A E is diagonal
 b) CG is diagonal f) HD is a median

- c) AG is length
- d) BF is a median

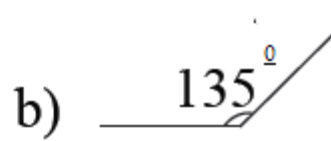
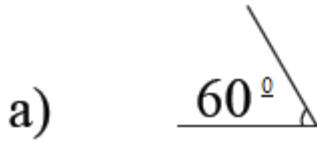
- g) GE is width
- h) CE is a length

10)



- 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

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9					
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