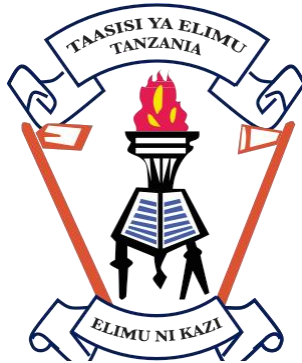


**TANZANIA INSTITUTE OF EDUCATION**



**TEACHER'S GUIDE FOR TEACHING SCIENCE  
AND TECHNOLOGY**

**FOR BASIC EDUCATION**

**STANDARD III - VII**

**TANZANIA INSTITUTE OF EDUCATION**

**TEACHER'S GUIDE FOR TEACHING SCIENCE  
AND TECHNOLOGY**

**FOR BASIC EDUCATION  
STANDARD III - VII**

© Tanzania Institute of Education, 2020

First edition, 2020

ISBN .....

Designed and prepared by Tanzania Institute of Education

P.O. Box 35094

Dar es Salaam-Tanzania

Tel: 255 22773005/+255 222771358

Fax: 255 222774420

Website: [www.tie.go.tz](http://www.tie.go.tz)

Email: [director.general@tie.go.tz](mailto:director.general@tie.go.tz)

All rights reserved. No party of this guide may be reproduced, stored in any retrieval system or transmitted in any form or by any means electronic, mechanical, photocopying, recording or otherwise without the prior permission of the Tanzania Institute of Education.

## TABLE OF CONTENTS

ACKNOWLEDGEMENT .....	vi
PREFACE .....	vii
CHAPTER ONE .....	1
INTRODUCTION .....	1
1.1 Background .....	1
1.2 The Objectives of the Guide .....	1
1.3 The Structure of the Guide .....	2
1.4 The Importance of the Guide .....	2
1.5 Targeted Group .....	2
1.6 How to Use the Teacher’s Guide.....	3
1.7 Develop 3R’s Skills .....	3
CHAPTER TWO .....	4
USING CURRICULUM MATERIALS.....	4
2.1 Understanding of Curriculum that Build Competence .....	5
2.2 Recognize Curriculum Materials .....	5
CHAPTER THREE .....	9
TEACHING AND LEARNING IN INCLUSIVE CLASS .....	9
3.1 Understanding the Concept of Inclusive Education .....	9
3.2 Recognizing Pupils with Special Needs .....	9
3.3 Teaching an Inclusive Class .....	10
3.4 To enable Pupils with Special Needs to Learn .....	11

CHAPTER FOUR .....	13
TEACHING AND LEARNING SCIENCE AND TECHNOLOGY .....	13
4.1 Understanding the Learning Theories that Develop Competence .....	13
4.2 Using Techniques and Methods of Teaching and Learning .....	13
4.3 Using Teaching and Learning Aids/ Materials .....	13
4.4 To Overcome Challenges in Teaching and Learning Process .....	14
CHAPTER FIVE .....	16
PREPARING TO TEACH .....	16
5.1 Preparation of Scheme of Work .....	16
5.2 Preparation of Lesson Plan .....	20
CHAPTER SIX .....	28
TO ASSESS LEARNING IN THE SCIENCE AND TECHNOLOGY SUBJECT.....	28
6.1 Understanding Assessment Concept .....	28
6.2 Understanding Perspectives in Learning Assessment .....	28
6.3 Assessment tools. ....	29
CHAPTER SEVEN .....	33
EXAMPLES OF COMPETENCE BUILDING PROCESSES IN SCIENCE AND TECHNOLOGY .....	33
7.1 Examples of Competence Building Process for Standard III .....	33
7.2 Examples of Competence Building Process for Standard IV .....	44
7.3 Examples of Competence Building Process for Standard V .....	54
7.4 Examples of Competence Building Process for Standard VI .....	60
References .....	68

## ACKNOWLEDGEMENT

The Tanzania Institute of Education (TIE) on behalf of the Ministry of Education, Science and Technology give thanks to all educational stakeholders who participated in preparations of this guide. TIE is also thanks all the participants from Institutions, nongovernmental organizations (NGO) and other different groups including Primary and Secondary School teachers. Teacher's from teachers college (tutors), retired curriculum developers, lecturers, education officers, educational quality assurers, directors and the curriculum developers from TIE who enabled this work to be done effectively.



Dr. Elia Y.K. Kibga  
**Acting Director General**  
**Tanzania Institute of Education**

## PREFACE

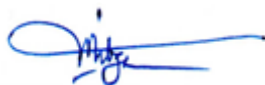
Tanzania Institute of Education has prepared this guide to enable a teacher to use the syllabus for Science and Technology of 2020 effectively. This teacher's guide aims to enable the teacher to implement changes to the syllabus of a Science and Technology subject that emphasizes building competences in teaching and learning so that the student can effectively deal with the life challenges in a surrounding environment .

Teacher, when using this guide you are advised to consider all the outlined elements in order to translate the syllabus requirements in teaching and learning activities within the classroom and outside the classroom. This guide comprises of seven main chapters, which are introductory, use of curriculum materials, teaching and learning in inclusive class as well as teaching and learning of Science and Technology. Other chapters are preparing to teach, assessing learning of the lesson and worked examples in development of competences.

Therefore, the teacher is encouraged to use this guide as a precious treasure for teaching subject effectively.

Tanzania Institute of Education will appreciate to receive any relevant suggestions and opinion from teachers and other education stakeholders for improvement of the guide. All comments, opinions and suggestions should be forwarded to the Director General, Tanzania Institute of Education.

Teacher, implement this guide to the maximum level. Provision of quality education is our responsibility.



Dr. Elia Y.K. Kibga  
Acting Director General  
Tanzania Institute of Education

# CHAPTER ONE

## INTRODUCTION

Teacher, in this chapter, you are expected to understand the background, the objectives of teaching the subject, objectives of the guide and its content. You will also be expected to understand the importance of the guide, the targeted user and how it should be used.

### 1.1 Background

Science subject was taught in primary school after independence as two separate subjects which are living things education and health education. From 1996 until the year 2005 Science was taught as a single subject with topics which have various scientific content. After reviewing the Curriculum in 2005 this subject was continuing to be taught as Science with improved of some topics which includes few skills of science and technology. Apart from that in 2005 the Information and Communication Technology subject was introduced and taught as dependent single subject.

According to the changes of the Curriculum in 2016, the subject of Science and Technology has been prepared to implement the present needs of the learners and the community in general. These needs are aims at producing a well equipped Tanzanian who can contribute in the development of our Nation, socially, economically and politically in this 21<sup>st</sup> century.

The Science and Technology subject, consist of technological skills including information and communication technology (ICT), experimental skills and various scientific and technological investigation, observation, investigation, inquiring and discovery.

The proper method of teaching and learning this subject is the one which emphasizes child centred and considering Science theories and practical's activities, you are supposed to use different techniques and methods which enables the learner to acquire science and technology skills. Therefore it is better to recognize that teaching of this this subject will enable pupils:

- a) To increase the level of understanding using knowledge and skills towards science and technology.
- b) To develop the ability of using science and technology to solve problems in everyday life.
- c) To develop the skills of using technological tools.

Therefore, the teaching of this subject in primary schools will bring about knowledge and skills required in everyday life towards science and technology. Hence to develop science and technology which brings about sustainable resources, concrete thinking and creativity in learning science and technology.

### 1.2 The Objectives of the Guide

The objectives of this guide is to help the teacher:-

- a) To analyse the curriculum and Syllabus of Science and Technology subject.
- b) To recognize the competence you are intended to have in order to enable the learner to develop the intended competence.
- c) To develop the skills of making and using teaching and learning AIDS/Materials.

- d) To develop participatory method skills in the teaching and learning process, which facilitates competence.
- e) To develop assessment skills for each learner and to make evaluation of their results.

### **1.3 The Structure of the Guide**

Teacher, this guide is made up of two main parts. These are Initial information of the guide and the main content of the guide. The initial information consists of cover page, title page, copyrights page, table of contents, preface and acknowledgement. The main content of this guide has been divided into seven main chapters. Chapter one involves introduction, Chapter two involves using curriculum materials, Chapter three involves teaching and learning in an inclusive class chapter four involves teaching and learning of science and technology subject, chapter five involves personal teaching preparations, Chapter six involves learning assessment of science and technology subject, Chapter seven involves examples of procedure in order to develop science and technology competences.

### **1.4 The Importance of the Guide**

This guide targets the science and technology subject teacher in primary schools, in order to improve your competences in teaching and to help learners to develop the expected competences in science and technology subject.

This guide will help you the followings:

- a) To implement the syllabus of science and technology. The syllabus emphasizes learning through practical in order to acquire the skills of investigation, inquiry, record keeping and to use investigation report in solving various problems.
- b) To emphasizes in developing competences in teaching and learning.
- c) To understand how to make teaching preparations in the science and technology subject correctly.
- d) To know how to use the assessment tools to develop competences to a pupil.
- e) To know how to solve various challenges in the teaching and learning process.
- f) To enable to make follow up in implementation of the curriculum.

### **1.5 Targeted Group**

The main targeted user of this guide is a teacher of Science and Technology subject for Standard III-VII. Other users are education quality assurers, trainers and tutors from teachers' colleges, curriculum developers as well as education officers. Not only those but also head teachers, students' teachers, examination officers, book writers, parents and other stakeholders.

### **1.6 How to Use the Teacher's Guide**

Teacher, in order to teach Science and Technology subject successful, you are supposed to do the following:

- a) To read carefully the guide, in order to comprehend the contents and teach by considering the syllabus which emphasizes the teaching that develops competence.
- b) Follow the given instructions in the teacher's guide in the teaching and learning process in order to be creative in teaching a subject.
- c) Teacher, you are emphasized to put more effort in following the given suggestion in the guide, in order to teach successful.



## 1.7 Develop 3R's Skills

You should realize that along with developing the 3Rs skills in Standard I and II, such skills should be strengthened in Standard III-VII. Skills in reading, writing and counting are developed in all subjects including Science and Technology subject. Therefore, when you are preparing activities to be performed by the pupils in the classroom you need to consider the development of such skills.

It is necessary to consider correct pronunciation of sounds, tonnation, and correct reading speed. You have also to ensure that all pupils have a correct interpretation of what they read every time you give them reading tasks. On the side of writing skills, you ought to help pupils construct letters correctly and that they abide to correct principles of writing when they write their works. Moreover, you ought to develop arithmetic skills by enabling pupils to pronounce and write numbers correctly and state the concepts represented by those numbers.

## CHAPTER TWO

### USING CURRICULUM MATERIALS

Teacher, in this chapter you will improve your knowledge of the Curriculum and how to use its documents successfully in the course of teaching Science and Technology subject. You will also understand the concept of a competence based Curriculum and use various documents that will help you in the implementation of the new Curriculum for Basic Education, Standard III-VII. Curriculum documents which are described in this chapter are: syllabus, teacher's guide, text book and supplementary book.

## 2.1 Understanding of Curriculum that Build Competence

Curriculum is a diverse concept which can be explained in various ways. It can be perceived as a list of all what a pupils learns under school supervision and it is the experience which a pupil gets after when undergoing his/her studies.

How do you perceive the term curriculum? It is important to realize that the meaning of curriculum depends on the perception of an individual. However for the purpose of this guide, curriculum is defined as a totality of activities which happen at school. Also you ought to realize that there is a curriculum which emphasizes teaching for content development: this is composed of content of various topics. Another curriculum approach is that which emphasizes on teaching for competence development. The curriculum for standard III to VII of 2020 takes this orientation.

What are the features of a competence based curriculum? Along with your responses, the competence based Curriculum has the following characteristics features.

- (a) It dwells in activities or actions based on the intended competences.
- (b) It focuses on professional actions or real life situations.
- (c) It has a flexible time frame to achieve prescribed competences.
- (d) It applies a criterion- referenced assessment.
- (e) Awards depend on the competence demonstrated by a candidate. (f) Insists on a pupil to be a centre of learning.

Despite the above clarification, you are advised to refer to the curriculum document for standard III to VII 2020 for more elaboration.

## **2.2 Recognizing Curriculum Materials**

Teacher, you should be aware that there are various documents which needed for implementation of basic curriculum for standard III-VII. Those documents are syllabus, teacher's guide, text books, supplementary materials and other references. These materials are discussed below:

### **2.2.1 Syllabus**

A syllabus may be defined as a summary of main and specific competences to be covered in a training course. Syllabuses are used to ensure consistency between schools so that all teachers know what must be taught and what is not required. Pupils may also make use of syllabuses to know what areas of learning they need to cover. Examinations will only test knowledge based on information included in the approved syllabus.

The 2020 Science and Technology syllabus for standard III – VII is the official syllabus approved by the Ministry of Education, Science and Technology. It contains a list of main and specific competences that a pupil is expected to develop on their completion of standard VII. It also provides the criteria to assess your pupils. You will need the 2020 Science and Technology syllabus in the preparation of your schemes of work and lesson plans.

### **2.2.2 Teacher's Guide**

A teacher's guide provides pedagogical strategies for developing the competences prescribed in the syllabus. It is a tool that will help you to interpret the subject's syllabus so as to enable pupils to develop intended competences.

Teacher's guide will enable you as a teacher to do the following:

- a) Use the syllabus precisely in lesson preparation and teaching of Science and Technology subject.
- b) Prepare teaching and learning materials.
- c) Lead pupils to develop competence and perform activities in teaching and learning.
- d) Involve pupils; assess yourself and the pupils during and after the lesson.

### **The relationship between syllabus and a teacher's guide**

For effective teaching, you must use the subject syllabus and the teacher's guide concurrently. A syllabus bears the image of a pupil while a teacher's guide bears the image of the teacher. Example, activities to be performed by a pupil have been sub-divided in specific activities for effective classroom learning. The syllabus has not incorporated teaching methods, those methods are described in the teacher's guide. Please, refer to the first chapter of this guide to get the structure of the teacher's guide.

### **2.2.3 Textbook**

Textbooks are among the curriculum support materials. In the context of competence based curriculum, a textbook is important because it provides content that enhance development of intended competences to a pupil. Moreover a textbook enables a pupil to learn on his/her own to facilitate attainment of relevant competences.

### **Features of a textbook**

The main feature of a textbook is that: its content focuses on developing competences specified in the curriculum and syllabus. Other features include;

- (a) It is written in conversational language to attract attention of the pupils.
- (b) It uses pictures and illustrations to enhance deep understanding of the concepts to the pupils.
- (c) It is written with consideration to a specific class, age and ability of the pupils.
- (d) The topics are sequenced in the same manner as the arrangement of competences in the syllabus.

### **How to use a textbook**

Teacher, once you get a textbook check if it is for your subject, the relevant class and year as per curriculum directives. You should also examine the competences and its alignment to the syllabus. You have to verify if the book has been written by the relevant authority (Tanzania Institute of Education). Chapters in the textbook are organised as indicated in the syllabus. So you are advised to identify the intended competences to be developed in each chapter. Textbook gives the teacher an opportunity to create content to be used in competence development. The content is in the style of case studies, short stories, conversation or dialogue and numerous illustrations. Similarly, you are advised to use thought provoking questions at the end of each story, dialogue and case studies that will help you prepare teaching and learning activities. You can use brainstorming questions contained in the book to conduct group discussions. These questions should be in the form of who, what? How? Where? and Why?

Use questions or tasks available at the end of each section of the textbook to assess the level of competence developed for each specific activity.

The student is required to use this book as directed by the teacher to read or perform several tasks before the lesson in order to get prior knowledge that will be used in developing intended competence.

Similarly in learning during the lesson, the pupils may read content when they are alone or in pairs and examine images such as pictures, tables and illustrations as well as answer questions or perform actions directed by the teacher so as to facilitate development of competence. The pupils will do the questions at the end of each chapter along with reflecting to assess the level of competences for each relevant chapter.

A textbook should not be used as an alternative to a syllabus. However, you are advised to evaluate a textbook in use to check on the relevant and validity of the content and whether it is suitable for development of intended competences by a pupil.

#### **2.2.4 Supplementary Books**

Supplementary book is a tool that you can use or direct the pupils to use, for the purpose of increasing their understanding in the topics or activities. This book is used alongside with a textbook or as the teacher may direct. This book is also important in building a reading culture in the pupil and it is a source of getting information in deep and knowledge beyond the teacher on various topics and activities. Teacher, this supplementary book is important because;

- (a) Increase the teacher's and pupil's knowledge.

- (b) An important aid for the teacher in getting extra knowledge for the lesson.
- (c) Helps the teacher to relate his/her subject with daily life.
- (d) Increase a reading culture.
- (e) Increase the pupil's ability to seek knowledge.

Teacher, along with those mentioned importance, the following are the characteristics of supplementary book:

- (a) They may not contain all the activities specified in the syllabus as a textbook would.
- (b) They may go deeper than the syllabus specified.
- (c) They may treat few topics deeper than others.
- (d) They must be approved by the government.

### **How to use a supplementary book**

Supplementary book facilitates development of competencies contained in the syllabus, but also includes content and exercises that make pupils' learn in depth and wider scope so as to develop higher level of competence. It also reinforces competence developed in class by providing opportunities for pupils' learning more than what learnt in class. For example, a student can get a case studies that help in developing specific competences more than contents in the textbook. Teacher, you are advised to recommend reference books to students that conform to your subject syllabus. Those textbooks should be written in simple language which are easily accessible and be accredited by the relevant authorities. Similarly there are additional exercises more than what is contained in the textbook.

Teacher, you can also use the book to find the descriptions of the content that will help you in preparing teaching and learning activities and assess your pupils. These books help pupils who can learn more to perform learning activities that will enable them develop competence to the best of their ability and speed.

### **2.2.5 How to Use References**

Teacher, you will be required to indicate reference books for the competence required to be developed by the learner. You should remember that reference does not only cover books, but includes other items such as magazines, newspapers, leaflets, radio broadcasts, videotapes, charts and various journals and knowledge from websites.

### **Reflection**

Teacher, once you finish reading this chapter, evaluate yourself by asking the following questions to see if you have gained the desired knowledge from the chapter: (a) What is the relationship between curriculum and the science and technology syllabus?

- (b) What are the curriculum support materials? What is their significance?
- (c) What is the importance of a Teacher's Guide to you as a teacher?



## CHAPTER THREE

### TEACHING AND LEARNING IN INCLUSIVE CLASS

In this chapter you will get to know the concept of inclusive education, how to identify pupils with special needs, how to teach inclusive class and how to enable the pupils with special needs to learn. Therefore, by the time you finish reading this chapter, you will have acquired knowledge and skills that will enable to teach in the inclusive classroom.

#### 3.1 Understanding the Concept of Inclusive Education

Teacher, I think you are aware that pupils differ in learning. In order the teaching and learning process to be successful in the inclusive class, a teacher should be capable enough of understanding the inclusive education, which emphasizes every learner to get an opportunity for quality education regardless their differences in psychological and biological features.

The concept of inclusive education system demands that, every learner should participate full in the teaching and learning process besides their differences. These differences includes:- Learners living in the difficult situations, biological and behavioural problems (behaviour disorders). The aim of this system is to observe, reduce or eliminate completely obstacles in the learning process. In addition, this system demands that all learning centres, schools and the education system as a whole to be transparent according to the needs of all pupils.

#### 3.2 Recognizing Pupils with Special Needs

Teacher, it is important to know that pupils differ in their learning requirements. Therefore it is very important to identify various groups of pupils with special needs which might be in your class. So that to help them for purpose of learning and building intended competence.

Can you identify those groups? Teacher, the groups of pupils with special needs includes:

- (a) Pupils with hearing impairments.
- (b) Pupils with low vision.
- (c) Slow learners.
- (d) Gifted and talented pupils.
- (e) Multiple imparement.
- (f) Children who are from vulnerable environment.
- (g) Children with behavioural problems.
- (h) Children who are psychological affected due to various reasons.

How would you identify pupils with learning difficulties? Please, read these strategies;

- (a) Diagnostic assessment: This is made during the initial registration stage in order to identify if there are pupils who do not participate in learning. The aim is to deeply find the reasons which make the pupil not to participate in the learning and playing activities.
- (b) To obtain feedback from parents or guardians about the needs of pupils/children.
- (c) To give them ordinary exercises of mentioning, reading, listening to a story being read, to express oneself loudly, to express oneself by writing a short story, or to draw distinctions between writings and pictures.
- (d) To identify them while teaching and learning, the way they act if they have heard you or not or if they fail read letters and pronouncing them as you write them on the board.

- (e) By using special diagnostic centres to discern such problems, for example to diagnose them in hospitals.
- (f) A student to repeatedly perform different activities from those she/he has been told to do.

### 3.3 Teaching an Inclusive Class

What do you perceive the term inclusive class? This is a class which combines all pupils from different physical, economic, social and religious backgrounds. These differences have an impact to learning abilities and styles of pupils. All these pupils have the right to feel secured and safe and be assisted to accordingly.

The purpose of an inclusive class is to reduce or completely remove hurdles which weaken the teaching and learning process. It is also to make a school friendly for learning to take place among all pupils. Failure to recognize and assist those pupils with special learning needs is to deny them with their rights to education.

Teacher, when preparing for teaching, you should consider that pupils differ in the way they learn. It is therefore important to use methods and techniques which engage all pupils in the learning process. You should ensure that pupils with difficulties in vision, hearing and speaking problems. Others include those with a very low speed of learning, mentally retarded and pupils with, multiple impairments. It is equally important to recognize and assist pupils who are vulnerable or at risk. Teacher, when preparing and teaching in an inclusive class you are supposed to understand in depth your pupils learning needs. Prepare your lesson by using flexible method, enough teaching aids/materials to enable successful learning. In order to have a successful teaching and learning in an inclusive class you ought to adhere to the following:

- a) Make sure you make follow up to all your pupils and understand their problems in learning.
- b) Arrange the pupils according to their background so that they can communicate and learn well according to their needs. Example arrange those with low vision together and let them sit in front of the class. During discussion put them in a semicircle so that they can be able to see each other properly.
- c) Arrange and use teaching Aids/materials to meet the needs of the pupils. Example a chart with drawings or pictures should be big enough with attractive colours in order to motivate the pupils to learn.
- d) Create proper participatory method which will enable each pupil to learn successful in the classroom e.g. to lead the pupils to perform scientific experiments in different sitting plans.
- e) During the teaching process use actions and signs according to the type of the learners in the class e.g the vision learners (who learn by seen), The learners who learn by practice with the practice learners who learn by discovery and walking.
- f) Make sure that the pupils with learning disabilities have extra time so that they can learn successful the various science and technology skills.
- g) Prepare assessment techniques and methods according to your class needs. More than one techniques should be applied to assess different groups. Example you can use oral questions, hand crafts as well as their ability to do scientific experiments.
- h) Set various criteria and levels to be achieved as it is instructed in the syllabus e.g.

beginners, developing level, competence and above competence learners. Those with high levels “write to them” above competence. Slow learners given them “beginners”. Those who do not fit in any level assess them according to their behaviour and actions.

- i) Create different activities and assessments which will suit the needs of the learners. Example you can assess them by observing their actions, behaviours, abilities in arts and sports and also in different life skills.

### **3.4 To Enable Pupils with Special Needs to Learn**

Remember that you can identify two groups of pupils with special needs. The first group can be that of severe problem. Take measures to take those pupils to the special centres with children of that kind of disability. The second group is that of pupils with mild disability. With this kind of disability you need to take various measures to enable pupils learn as indicated in the case study. Now, read the following case study in order determine what you need to learn in order to overcome the teaching and learning challenges in your class.

#### **Case study:**

*Mr. Basitena has been teaching Science and Technology lesson in standard three at Mabadiliko Primary School since January until the school closed in June. The teacher had been reporting that in his class there are three naughty pupils. The first one always does a few assignments and most of time refuses to do the assignments. If he does, he does them wrongly. The second pupil pronounces and reads words wrongly. Mr. Basitena adds that, a third pupil, behaves wildly. When he picks on him to answer a question, he stares at the teacher with a lot of tension and embarrassment. He concluded that the three pupils do not respect him and are adamant to his instructions he gives in class. He punished them several times. Mr. Basitena reported them to the school administration. He had suggested the group be disbanded from his class.*

*When the school re-opened in another term in July, Mr. Basitena was transferred to another school. Ms. Upendo was assigned to be the class mistress and teach English language in that class. This teacher, noticed that the three pupils were willing to learn and enjoyed learning, but there was something a mystery about them. She involved fellow teachers to monitor them closely. She also involved the head of school. She disfavored the use of punishment to students as motivation for learning.*

*After a long study, it was observed that there were many pupils with diversified learning cases. The school administration decided to conduct a diagnostic test in all classes. The school administration involved experts specialized in learning cases. The experts' report identified several pupils learning problems. The problems included pupils' visual impairment, hearing (auditory) impairment, slow thinkers, and pupils with speaking problems. The report also had highlighted on the existence of talented and the gifted, shy and timid pupils; these are pupils who are easily frightened because of poor emotional control; fear, tension and embarrassment. When timid pupils become self-conscious they lose confidence. When the lack of confidence is overwhelming, it interferes their learning.*

*The report suggested for an establishment of a rescuing program. The program deliberated solutions in five areas. Each teacher was asked to report to the head of school observation of any identified problem area in their classes. Teachers were to look for:*

- a) *Pupils with visual impairment and make them sit on the front desks in classrooms.*
- b) *Pupils with minor auditory problems, and pair them or team them up with pupils who read for them aloud. If a teacher observes pupils with vision problems, he/ she should write text in more visible print on the chalk board for their favor.*



- c) *Pupils with problems in communication (those who think for a while before responding, those who have difficulty in pronouncing some of the words and in constructing sentences), will be teamed up with pupils who can help them.*
- d) *Shy/fearful and timid pupils. These would be encouraged to make a try in performing a task in class and cooperate with their fellows. All pupils in classes would be educated that pupils are different, therefore they should accept differences among themselves. There should be permanent continued changes of sitting plans in classes to provide opportunity for pupils to learn about each other. All teachers were to ensure provision of tasks to all pupils and give each pupil a turn to perform a task in class so as to learn to be confident.*
- e) *Talented and gifted pupils. Teacher should identify and recognize their giftedness. Although we talk of equality in education, the fact remains that other pupils are more gifted than other. Some teachers label them nuisances, other teachers are intimidated and other keep them busy to tutor less capable pupils. A good teacher is supposed to:*
  - i) *Accept them.*
  - ii) *Make pupil understand they each excel and exceed differently*
  - iii) *Allow them to explore and pursue their gifts and channel their gifts.*
  - iv) *Help the gifted to be resilient in difficult learning tasks*
- v) *Do not be intimidated, do not give them bad names*
- vi) *Provide them a room to learn intuitively. This would enlarge pupil's natural gift*

## **Reflection**

Ask yourself about the issues which impressed you in this chapter and what other things you think you need to search for more information in order to equip yourself well in Science and Technology lessons.

## **CHAPTER FOUR**

### **TEACHING AND LEARNING SCIENCE AND TECHNOLOGY**

Teacher, in chapter two, of this guide, you have learnt in deeply how to use curriculum tools in teaching Science and Technology subject. This chapter will enable you to understand the type of teaching and learning in this subject, emphasizes developing of science and technology skills which are used in everyday life.

#### **4.1 Understanding the Learning Theories that Develop Competence**

Teaching and learning that develops competence in the subject of science and technology follows various techniques which facilitate successful teaching in order to acquire the competence specified in the syllabus of the subject. These techniques involve teaching and learning by doing, to develop the spirit of inquiry in the pupils; to foster co-operation in learning, to create awareness in the teaching and learning environment; to relate one subject to the others; to apply the principles of science and technology correctly and to assess learning on the stipulated criteria basis.

Teacher, you should understand that the teaching that develop competence is mainly based on some teaching theories. According to the recognition theories, the learner develops the intended competence if the previous competence corresponds to the new one. The pupil develop a new competence if only she/he is enabled to create a new concept in the mind. Therefore, during the teaching and learning process, you must first know the previous knowledge/competence the learner has so that it can help in developing the intended competence.

In addition, learning is said to be an activity which relies on the things surrounding the learner on daily bases. Competence development is achieved if the pupils participate with other in the learning process. Therefore, you should know the ability and capacity in learning for each pupil, and be able to assist them to develop the intended competence. In line with the principle and theories of learning, you are advised to use the teaching methods which involves every learner to assess the learners learning activities, and to record the whole teaching and learning process.

## **4.2 Using Techniques and Methods of Teaching and Learning**

Teacher, teaching techniques involve proper ways of arranging specific competence and its learner's activities so that she/he can learn successful. You should arrange teaching and learning activities which make the learner to think and participate in the teaching process. You should know that there are many methods of teaching a lesson. The activity of teaching and learning successful involves arranging the pupils in pairs, groups, subject trips and role play. Learners will develop competence if you arrange them in such a way that they can interact in the learning activities.

## **4.3 Using Teaching and Learning Aids/ Materials**

Teaching and learning Aids/materials are tools which help you to enable the pupils to develop the competence. These are tools which a learner uses by the guidance of the teacher in order to develop specific competences. In addition, the uses of information and communication technology tools is very important in teaching and learning this subject.

### **a) Characteristics of teaching and learning materials/Aids.**

Teaching and learning materials/Aids should be prepared by considering the following:

- i) Should be prepared according to the age and ability of the pupil.
- ii) Should be safe for the pupils.
- iii) To be attractive to the pupils.
- iv) To build creativity to the pupils.
- v) They have to be durable.
- vi) To indicate clearly the intended concept.
- vii) Must be big enough to be seen.

**b) Things to be considered when choosing the teaching and learning tools.** There are many things to consider when choosing the teaching and learning materials/ Aids.

- i) To be available in your environment.
- ii) To be cheaper.
- iii) Easy to be prepared.
- iv) Correspond to the competence intended to be developed.
- v) To consider pupils with special needs.
- vi) To correspond with number of pupils in the classroom

### **c) Teaching and learning materials/Aids for the pupils with special needs.**

The school with normal and special needs pupils should consider the teaching and learning materials which will suit all of them in the class. There should be the braille machine, spectacles for the low sighted disabilities, and hearing aids for those with hearing disabilities.

#### **4.4 To Overcome Challenges in Teaching and Learning Process**

In the teaching and learning process there are various challenges we can face. Some of them are:

- a) Big number of pupils in the class.
- b) Shortage of teaching and learning materials/Aids.
- c) Teachers lack in-service training therefore they are not ready to change with new approach.

#### **Case study: Teaching a lesson in a class with a big number of pupils**

*Teacher X of Mwanzo mgumu primary school went in the classroom to teach science and technology subject for 40 minutes. The classroom had almost 100 pupils, the lesson was taught by following the teaching stages. He begun with introduction as usual. After the introduction he/she continued with the stage of development of competence. In that stage he started to divide the pupils in small groups. He directs them in their groups to observe living organisms and other things found in the environment from the given charts and drawings. He started to pass around each group, when he reached the fifth group among ten groups, the period was over.*

*Teacher X was supposed to leave the class without reached the intended objectives of the lesson and still asking himself what to do in order to overcome that challenge.*

*One day, teacher Y went to teach in the same class having 100 pupils, but she was creative because she used participatory method in teaching process. She used jigsaw method. This method is used to teach in the class which have a big number of pupils. That teacher had enough skills to use that technique. Then he achieved the intended objectives in teaching that period.*

#### **Reflection according to the case study above**

Teacher, what have you learnt concerning the case study above?

Teacher, I think you have discovered that jigsaw method is the one which helps the pupils to learn on their own. Pupils enjoy more and more in learning because they discover that they are experts on the area they have learnt and teach others. Also this method helps the pupils to learn many things in a short time.

## CHAPTER FIVE

### PREPARING TO TEACH

This chapter guides you on basic issues in doing important preparations so that you can teach Science and Technology subject. The teacher is the main facilitator in the process of learning. Thus, you need to be aware of your pupils' psychological and physical needs. You need to treat and assist each pupil so that he/she attains particular competence depending on his/her level. Teacher, teaching preparations is an important aspect you are supposed to do before you go to teach in the class. In order for your teaching to be successful, you are supposed to prepare a scheme of work and lesson plan which will guide you to accomplish the syllabus objectives. This chapter guides you how to prepare a scheme of work and a lesson plan.

#### 5.1 Preparation of Scheme of Work

This is a program of the syllabus implementation which is prepared for a certain period of time. This program is being prepared by the subject teacher. You must understand the syllabus clearly in order to prepare the scheme of work. The structure of the scheme of work is divided into two parts:

These are part one (prior) and part two (table). Part one includes the following: Teacher's name, subject, class, term, year and the name of school.

The second part includes the following:-

Main competence, specific competence, pupil's activities, month, week, number of periods, reference, teaching Aids/materials, assessment criteria and remarks.

#### Importance of scheme of work

Teacher you have to understand that scheme of work is important for the following:

- (i) It helps the teacher to manage well the time in implementing subject syllabus.
- (ii) It enable another teacher to take part in case of commitments.
- (iii) It makes easy follow up in teaching and learning process.

#### Structure of the Scheme of Work

Name of school..... Name of Teacher..... Subject  
..... Class ..... Term  
..... Year .....

Main Competence	Specific Competence	Teaching activities	Month	Week	Number of Periods	Reference	Materials/Aids	Assessment Tools	Remarks
-----------------	---------------------	---------------------	-------	------	-------------------	-----------	----------------	------------------	---------

This structure contains ten stages as follows:-

#### a) Main Competence

This is an ability of achieving a certain task effectively and successfully after a particular time of learning. The main competence is built up by various specific competence which are developed after participating in various learning activities.

#### b) Specific Competence

Specific competence is the ability built by a pupil in performing different activities in a specific time.

#### c) Teaching Activities

These are activities which a teacher should do in order to enable pupils to achieve targeted main activities. Teacher's main activities are not identified in Syllabus and guide so you are required to prepare by considering the main activities you intend to teach. For example to teach the main activity of identifying non-living and living things in the environment the following methods can be used:-

- (i) To prepare discussion in groups in order for pupils to discuss about non living things and living things found in their environment. Physical appearance and characteristics of living things.
- (ii) To prepare explanation on charts in order for pupils to use sensory organs.
- (iii) To prepare drawing of living things and non living things so as pupils use brain storming method to differentiate them.
- (iv) To prepare activities outside of the class so as to let pupils investigate and identify the characteristics of non living and living things.
- (v) To prepare debate to the pupils about importance and uses of non living and living things in the environment.

**d) Month**

Obvious you understand the importance of estimating time in a term, month and week in a scheme of work. You are supposed to show a month which you will start teaching in order to build the competence intended to the learner.

**e) Week**

This is the time estimated in teaching and learning according to the weight of the activity to be done by a pupil. The estimated time is set in such a way that each period covers 40 minutes. However this proposed number of periods can be changed depending on the teaching and learning circumstances.

**f) Number of periods**

In this column of the Scheme of work, you are supposed to estimate the number of periods you will use to enable pupils to perform a particular task. The estimations of time distribution are done to each specific activity. Therefore you have to use this estimation to obtain the number of periods for each main activity. It is also important to consider the scope and weight of each main activity in order to determine the number of periods needed to teach it. Finally consider a number of periods for a particular subject in a week.

**g) Reference**

It shows books and other references proposed materials in order to make the intended teaching and learning activity successful. Examples of other references are journals, leaflets, charts, radio programs, video tapes, websites and various educational articles.

**h) Teaching Aids/materials**

In this part you are supposed to identify Teaching and learning aids you will use in the teaching and learning process in enabling pupil to perform an activity concerned. An example of teaching aids are real objects which are found in the environment and which are related to the activity concerned, picture, copies of case study, charts and different publications.

**i) Assessment tools**

In this column you are supposed to categorise assessment tools which you will use to archive the action of assessing learning of the activity concerned. Some tools which you can use are like checklist, portfolio, exercises and performing charts.

**j) Remarks**

In this column you are supposed to write the information which shows success or failure of teaching and learning process. Therefore you are supposed to show the level of learners in performing the activity intended. If pupils failed to reach the intended competence, you are supposed to give reasons and measures to be taken to rectify the situation.

Specific competence	Teaching activities	Month	Week	No. of periods	Reference	Teaching and learning aids	Assessment tools	Remarks
Investigate the things that are in the environment.	<p>i) To find out the living and non-living things that are in the environment.</p> <p>ii) To prepare explanation on charts in order for pupils to use sensory organs to perform activities.</p> <p>iii) To prepare drawing charts of living and non-living then pupils differentiate them</p> <p>iv) To prepare outdoor activities for pupils to observe living things and non-</p>	January	1	5	<p>TIE (2006): Textbook Science And Technology- Std. III Dar es Salaam</p> <p>J. Malota, na G. Manyonyi na D. Cornel (2009) Sustainable Science Standard III Longman Publisher,</p> <p>Dar es Salaam. Oxford Publisher (2013)</p>	<p>Models Charts Living and non-living things and drawings</p>	Exercises and Tests	The planned teaching activities have been implemented fully. Pupils have been able to identify living and non-living things that are in the environment.

**Sample: SCHEME OF WORK**

**Name of school** Mwanzongumu Primary School  
Juhudi Chapakazi

**Name of teacher** :

**Standard III**  
and Technology

**Subject:** Science

**Year:** 2016

:

<b>Main competence</b>
To perform scientific and technological investigation and discovery.

living.



## 5.2 Preparation of Lesson Plan

The next step after preparation of Scheme of Work is to prepare a Lesson Plan. A Lesson Plan is an arrangement of the procedure of what should be done by the teacher and the pupils in the class. It will indicate how to conduct the teaching according to the main themes of the lesson. Teacher can ask him/herself the importance of lesson plan. You should know that importance of lesson plan can be seen in the following:

- (a) It enables the teacher to teach systematically in order to motivate learners.
- (b) It enables the teacher to prepare teaching Aids.
- (c) It helps to manage proper uses of time while teaching.
- (d) It helps the teacher to teach all prepared content in a period.
- (e) It enables another teacher to teach your subject in case of commitment.

### Structure of a lesson plan

A lesson plan is divided into two parts: the first part includes the names of the school and the teacher; the main competence, class, date, period, time and a table of attendance. Others include main competence, specific competence, main activity, specific activity, teaching aids/materials and reference books. The second part contains the steps of teaching the lesson. This is a table showing the steps: introduction, developing competence, consolidating the competence and conclusion, teaching and learning activities and indicators of assessment. Other aspects of the lesson plan are reflection, evaluation and remarks.

### Structure of a Lesson Plan

Name of school \_\_\_\_\_

Name of teacher \_\_\_\_\_

Subject \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

Period \_\_\_\_\_ Time \_\_\_\_\_

#### Number of pupils

Registered			Present		
Girls	Boys	Total	Girls	Boys	Total

Main competence: \_\_\_\_\_

Specific competence: \_\_\_\_\_

Main activities: \_\_\_\_\_

Specific activities: \_\_\_\_\_

Teaching Aids/materials \_\_\_\_\_

References Books \_\_\_\_\_

Steps	Time	Teaching activities	Learning activities	Learning indicators

Introduction				
Developing the competence				
Consolidating the competence				
conclusion				

**Reflection:** \_\_\_\_\_

**Evaluation:** \_\_\_\_\_

**Remarks:** \_\_\_\_\_

**The aspects of lesson plan are explained below:**

### **5.2: Preparation of a Lesson Plan**

Teacher, in this part you will get elaborations concerning the items of a lesson plan. Some of the items have been elaborated earlier in a scheme of work. the remainder are elaborated here as follows:

#### **a) Main activity**

This is an activity which a teacher aims to develop to pupils after undertaking several periods of learning.

The activities are outlined in the syllabus and are sub-divided into specific activities (specific activities).

In this item, you are required to write the objective of teaching and learning the main activity which a pupil is expected to accomplish. You are also required to write the intended attitude which a pupil will develop after accomplishing the activity. The wording used to explain the item are supposed to be general statements like a pupil should be able to know, understand and use.

#### **b) Specific activity**

This is a specified activity which a teacher aims at developing to pupils in a single period of interaction. When preparing a lesson plan you are required to fill the sections of main and specific activities with objectives derived from activities you aim at developing to your pupils.

Specific activities should have features which can be summarized in the acronym SMART. It stands for features qualifying each specific activity to be; Specific, Measurable, Attainable, Realistic and Time bound. These features are further elaborated as follows:

- (i) **Specific:** This implies that a specific activity should be a single specified outcome to be performed.
- (ii) **Measurable:** This means that each specific activity should clearly indicate criteria of measurement.
- (iii) **Attainable:** It should be achievable; it should be an activity which you are capable of developing to the pupils.
- (iv) **Realistic:** Specific activities should be practically possible and real instead of actions that are only stated and possible in dreams.
- (v) **Time bound:** This implies that it should have an aspect of time to be accomplished. In most cases primary school periods last for 40 minutes.

These are the activities that have been broken down from the main activity which the pupil will learn in the class in order to build the intended competence. These activities are not shown in the syllabus. You have an opportunity to add other activities that will help to fulfil the goal of the respective main activity. These activities have been attached at the end of this guide.

### **c) Indicators of Learning**

These are actions a pupil has to perform in every stage of the lesson in order to show the level of competence she/he intends to develop. Writing of the actions which indicate learning depends on the learning activity in the introduction stage, development of competence stage, consolidating of the competence and conclusion. Also, indicators of learning need to match with specific activities so that they are achievable and understandable to teachers, pupil and the society at large. Refer to the example of a lesson plan to identify how to write indicators of learning.

### **d) Introduction**

This is the first step in teaching and learning. In this step you are supposed to prepare the pupils to start to develop the required competence. You can start with a song or exercise, show a model, pictures or anything that is related to the new or previous subject.

### **e) Developing competence**

This is the second step in teaching and learning which develops the pupil's competence.

In this step you put the pupil in a situation in which he/she can develop the required competence taking into account that the pupil is the main actor and you are there to assist and direct him/her to perform the required activity.

### **f) Consolidating the Competence**

As a teacher you must organize the pupils to improve their competence by doing exercise using the competence you have built in them. You should also lead them to apply their competence in real daily life situations.

### **g) Conclusion**

This stage includes all activities which have been done in the teaching and learning process. You can do this by allowing the pupils to do activities which help to use the last gained competence.

## **h) Reflection**

The aim of this part is to provide you with an opportunity for developing your professionalism in the educational field. In order to reach this aim, you are supposed to do a reflection which will help you to improve your teaching. In this part you are supposed to ask yourself about teaching and learning in order to identify effectiveness and challenges raised in that process and do improvement in the next teaching.

## **i) Evaluation**

You have to stick on reflection you did about the whole process of teaching and learning, then ask yourself about the extent at which pupils' performance of the activity holds the quality enough to develop the intended competence.

Teacher, the following are some aspects and questions which can lead you in reflection and evaluation.

<b>Aspects</b>	<b>Question in reflection</b>	<b>Question in evaluation</b>
Activities to be done by Pupils	(i) Which new thing have I learn from the result of this activity? (ii) How do I know that pupils learned as it expected? (iii) Why the given activities enable/disable to build competence proposed?	(i) Which Standard/ amount reached after the proposed activities to be done? (ii) Were the pupils learn as it was expected? (iii) Activities given enable pupils to build proposed competence?
<b>Aspects</b>	<b>Question in reflection</b>	<b>Question in evaluation</b>
Teaching and learning methods	Why the teaching and learning methods develop competence to the pupils or not?	Were the teaching and learning methods effective?
Teaching and learning Aids	Why the teaching and learning methods used were effective or not?	Were the teaching and learning Aids effective?
Teaching and learning	(i) Did I explain the scientific concepts clearly or not? (ii) Why I implemented the different from what I arranged?	(i) Were my explanation understood to the pupils? (ii) Which part of lesson plan implemented differently from what I arranged?

Pupils activities	(i) Are the pupils reached standard intended according to the explanation or not? And why?	(i) Which performance standard attained from explanations?
	(ii) Why the pupil failed/succeed to relate things he/she learn with the daily activities?	(ii) Did the pupils able to relate their competence to their daily lives?

**NOTE:** Explanations about evaluation of teaching and learning can be given by considering the standard/quantity or value/quality of your performance and the pupil's performance. Also when reflecting about teaching and learning you are advised to use questions which target at efficiency and effectiveness of the teaching and learning process.

### J. Remarks

After you have answered the questions on reflection and evaluation with other questions you might create, you have to give opinions and resolutions to take for improved future performance. Your remarks may be based on the following:

Identify the areas of teaching which you will change and specify the changes in order to improve the success of the lesson.

Identify new things you have learnt in the particular lesson.

Explain how you will help the pupils who did not reach the intended performance.

### An example of a lesson plan

**Name of school:** Mwanzomgumu  
**Teacher's name:** Juhudi Chapakazi  
**Subject:** Science and Technology **Class:** III  
**Date:** 25/01/2016 **Period:** 3 **Time:** 3:20-4:00

Number of pupils					
Registered			Presents		
Girls	Boys	Total	Girls	Boys	Total
21	19	40	20	19	39

**Main Competence:** Perform scientific investigation and technological discovery.

**Specific Competence:** To investigate things that are in the environment.

**Main activities: Within several periods a pupil can:**

Recognize living and non-living things in the environment.

**Specific activities:** Within a period of 40 minutes a pupil can: Identify living and non-living things in the environment.

**Teaching aids/materials:** Models, wall chart, real objects (example phone, insects), drawings.

**Reference Books:**

TIE, (2016) Science and Technology Std III, TIE Dar es Salaam.

Makota, J, Manyoni and Cornel, D. (2009). Sustainable Science book three Longman Publishers, Dar es Salaam.

**Teaching and Learning Stages**

Stage	Time	Teaching Activities	Learning Activities	Learning indicators
Introduction	5 min	Ask the following questions: (i) Mention three non living things you know. (ii) Mention three living things which you know.	To mention three non living things and three living things which are found in the environment.	Three living things and non-living things that are in the environment to be mentioned correctly.
Development of competence	20 min	To lead the pupils to mention non living things and living things:- i) Divide the pupils into small groups. ii) Guide them to use charts and drawings to mention non living things which have been shown. iii) Lead the pupils to present their group works and help them to correct/ mark the answers.	i) To sit in small groups ii) To discuss in their groups. iii) To observe the drawings and charts and mention three non living things and living things shown in the charts and drawings. iv) To present their group works	Three non- living things and living things found in the environment to be identified correctly.

Consolidating the competence	5 min	<p>i) Choose pupil from each group to mention non living things and living things by using real objects and models you have prepared.</p> <p>ii) Guide pupils to observe things and living things in their groups.</p>	<p>i) Pupils to observe living things and models</p> <p>ii) To mention things and living things and observed in their groups.</p>	Non -living things and living things in the environment have been observed by the pupils correctly.
Conclusion	5min	Conclude the lesson by considering teacher's and pupil's evaluation by guiding them to give the correct answers.	To give suggestions according to the teacher's and class evaluation.	Suggestions according to the reflection to be expressed.

### Reflection

- Why the teaching method developed competences of the subject or not?
- Did I explain the scientific concepts clearly or not?
- Did the pupils participate successful in learning performance or not?

### An example of a teachers reflection concerning teaching and learning

I made efforts to apply interactive teaching and learning methods to make pupils cooperate and learn effectively. Pupils were excited with the methods because they allowed them to use their prior knowledge to develop the intended competence. I was amazed that they were reluctant to go out during break time. However I had some flaws in classroom management techniques and I spent some few minutes of the next period which belonged to a different subject.

### Evaluation

My clarification and explanation enable most of the pupils to identify non living and living things found in environment. Few pupils are in the beginners' level because they failed to understand my explanations. However, pupils have managed to get skills of writing, speaking, listening and writing through group discussion.

### Remarks

In the next lesson I will improve discussion groups in order to save time for presentation. Few pupils who are in the level of beginners will be helped by their fellows in groups. However, I will arrange new groups by mixing up the begginers and those who perform good so as to enable them help each other during the learning process.

**NOTE:** Teacher, you have to realize that, one specific activity can be done within one period or more depending on the depth and scope of the specific activities.

## CHAPTER SIX

### TO ASSESS LEARNING IN THE SCIENCE AND TECHNOLOGY SUBJECT

Teacher, in this chapter, you will learn how to make an assessment which develop competence in the science and technology subject. The chapter identifies the assessment tools and criteria in the learning which lead to competence development.

#### 6.1 Understanding Assessment Concept

Teacher, learning assessment is an important aspect in the teaching and learning of a subject. In the implementation of competence based curriculum, the emphasis is put on enabling the pupil to build an ability to think before acting and then to think about the outcome of his/her actions so that she/he can think twice the future expectations. In the assessment, the teacher should consider the main types of assessment which are:-

- a) Placement assessment this is done at the beginning of the course or stage in order to know the readiness of the pupils to the intended class or level.
- b) Formative assessment is a continuous assessment sometimes is known as educational assessment which helps in the process of teaching and learning.
- c) Diagnostic assessment is used to identify the ability in performance of the pupils according to the set criteria. This assessment is done at the beginning of a new learning level.
- d) Summative assessment is done at the end of the class level/course level. It is used to give the marks obtained by the pupils in the course by indicating grades.

#### 6.2 Understanding Perspectives in Learning Assessment

There are two concepts of learning assessment which are ought to be understood so that to achieve the teaching and learning that develop the competence intended to the pupil.

##### 6.2.1 Assessment According to the Level of the Themes

Teacher, this concept aims at assessing the pupil on the level of the given theme after the learning process. This assessment demands the pupil to know the given instructions which will enable the teacher to recognise the pupil's level of understanding. The assessment tool used here are questions which need the pupil to give explanations that indicate what he/she ought to fulfil. The teacher is supposed to identify the learning outcomes which will be assessed in specific time.

##### 6.2.2 Assessment According to the Level of Competence

Competence based assessment is based on activities performed by pupils, so ther assessment is very strong considering the process rather than the content based assessment. These type of assessment uses some of the principles used in continuous assessment. Due to the fact that competence based assessment allign to greater extent with process of teaching, so the two things go together continuously.

Teacher, you need to realize that competence based assessment involves all learning domains to include cognitive, psychomotor (performance) and affective. Thus, you should prepare assessment questions reflecting all learning domains. However, experience showed that a large number of questions prepared by teacher are at the lowest level of cognitive domain and do not assess the affective and psychomotor domains. Competence based assessment is the kind of assessment that is done at a certain period in order to determine the level of pupil's performance.



Pupils is assessed for what he/ she is able to do. This approach involves assessing the level of competence of the pupil after learning.

This kind of assessment gives an opportunity to a pupil to conduct self assessment and teacher to assess pupil's performance together with the ability of the pupil to assess him/ herself.

Assessment in competence based curriculum takes this perspective. Therefore, you are advised to use tools for assessing competence in Science and Technology subject which involve pupils in assessing their own performance and their ability to assess themselves. Choose assessment tools, procedures or tools for collecting data to show if every pupil has attained to assess the results of learning expected.

### 6.3 Assessment tools.

Teacher, in order to assess the pupils ability in performance and the ability to assess himself/herself it is relevant to use the assessment tools indicated in this section. These tools include rubric or performance charts.

#### 6.3.1 Rubric

Teacher, rubric is a set of performance indicators which identifies the pupil in the performance assessment. You can prepare performance indicators and then let the pupil modify them according to what is intended to be assessed.

Many rubrics show performance indicator for each item to be assessed. Performance activity should be shown to the pupils so that he/she can be able to know what he/she is supposed to do and at what extent. This will enable the pupil to make self assessment as he/she is working and at the same time try to examine the level of performance acquired.

#### An example of rubric in science and technology subject

Teacher, the following example will help you in preparing a rubric tool in science and technology subject, about environmental cleanliness activities in the society.

The following table 6.1 is concerned.

Performance	Levels of performance (Benchmarking)			
Criteria	Beginner 0-4	Average 4 – 5	Good performance 6 – 7	Very good performance 8 – 10
Slashing grasses.	Slashing grasses without observing procedure.	Slashing grasses observing few procedures.	Slashing grasses by observing all the procedures.	Comes up with new procedures of facing the challenges of slashing grasses.
Destroy breeding grounds of insects	Discovers the breeding ground of insects	Understanding the procedures of destroying the breeding grounds of insects	Destroys the breeding ground of insects around the shade.	Explains to colleagues the procedures of destroying the breeding ground of insects.

#### 6.3.2 Performance Chart

This is a chart which shows the level of performance which you have set for your pupils. You will write phrases which indicate what has been done under each criteria. The pupils will then put a tick under each criteria according to the level of performance attained in each indicator. See table 6.2 on how to develop tools for assessing specific competence in doing scientific practicals correctly: This chart will be used in all assessment activities which develop specific competence.

**Table 6.2. How to form an activity chart**

		Performing criteria			
		1	2	3	4
	To identify the problem to be solved				
	Ability to follow instruction carefully given in written or oral way.				
	Select and use the proper Teaching aids/ materials for the given work.				
	Ability to select and use Teaching aids/ materials effectively and correctly.				
	Ability to use the Teaching aids/materials correctly and safely				
	To record information in a specific way.				
	To accept conclusion according to the data/ information collected.				
	To refer to the weakness and conclusions according to the experiment results.				

**Key**

- 1 = Beginner                      2 = Average  
 3 = Good                            4 = Very good

**6.3.3 Checking List**

Teacher, this is a tool which is used to prove the achievement or specific competence. It is used to prove the presence of things, the ability to identify things which indicates the particular competence.

If the checking list is used to identify the quality of mentioned criteria, you will set the level of quality by using numbers as shown in table 6.3.

**The structure of the checking list**

**Pupil's name:** \_\_\_\_\_

**Class:** \_\_\_\_\_

**Exercise:** The report of the changes of a seedling which planted in light

**Date:** \_\_\_\_\_

**Teacher's name:** \_\_\_\_\_ **Table 6.3.**

**Example of checking list**

		Performance criteria			
		1	2	3	4
1.	To complete the work on time				
2.	Work arrangement.				
3.	To observe the work carefully.				
4.	To seek for help if needed.				
5.	To do work independent				
6.	To cooperate with others in work.				
7.	Being at work.				

**Key**

- 1= Beginner
- 2= Average
- 3= Good
- 4= Very good

**Remarks**

Give your remarks according to the level of performance.

**Descriptions of items of pupils performance criteria**

- a) Beginning: This is the lowest level of performing the main activity specified. At this level a pupil manifests signs of being able to do the activity. He/she also dares to do but with major errors.
- b) Average: This is the level where a pupil is able to do the activity, but cannot explain the principles of doing it and in most cases he/she needs an expert teacher to guide him/her in order to do it properly.
- c) Good: This is the level of performance at which the pupil can do and explain principles of doing the specified activity.
- d) Very good: At this level the pupil is highly competent. He/she is able to do the activity through guiding principle and he/she can improve or create new.

**6.3.4 Portfolio**

Teacher, This is a collection of difference reflections which shows the competence development in a particular subject. This assessment gives the pupil a task to learn her/ him self and use the suggestions from others. An assessment using portfolio strengthens the pupil in developing important personal learning skills.

Teacher, you will guide the pupil to collect and prepare things to put in a portfolio.

The items to be put in a portfolio include:-

- i) Lesson notes for science and technology subject
- ii) Work done, example test papers, and project works. iii) Subject reflection work of the class. iv) Real life episodes.
- v) Scientific and technological materials from different sources. vi) Chart, pictures and drawing from what was learnt.

Then, it is good to guide the pupils to arrange portfolio according to the specific competence in order to simplify personal study.

### **Assessment criteria of the portfolio**

Teacher, you can suggest a way of assessing portfolio and give marks on it. Chart 6.4 can help you to create things used to assess the portfolio in a correct way.

**Table 6.4 Assessment criteria of the portfolio**

SN	Criteria	Marks
1.	The relationship between the collected things and the intended specific competence.	
2.	Things collected are arranged in groups of specific competence.	
3.	The fellow pupil remarks	
4.	The pupil has done reflection on the things collected in the portfolio.	

## **CHAPTER SEVEN**

### **EXAMPLES OF COMPETENCE BUILDING PROCESSES IN SCIENCE AND TECHNOLOGY**

In this chapter you will develop the skill to differentiate the main competence and specific competences of the subject and process various activities in order to achieve specific competences expected to be developed to a pupil.

This chapter will also enable you to develop skills for using various techniques and tools in teaching and learning the subject successful.

You are supposed to know that each specific competence will be attained after completion of main activity as stipulated in the syllabus.

Likewise, various specific activities or learning activities are needed to complete one main activity.

One specific activity should be analysed by the teacher during teaching. Various indicators of learning indicated in a lesson plan will be used to assess the success of the activity.

In these guides, the examples given focus on main activity and are obtained from one specific competence for each main competence specified by each class in the subject syllabus.

In this guide, the examples given from the main activity are obtained on one specific competency for each main competence, specified by each class in the subject syllabus. You are emphasised to implement well all identified learning activity in the syllabus. Sections 7.1 up to 7.4 concerning with examples of competence building process for standard III-VI.

## **7.1 Examples of Competence Building Process for Standard III**

### **7.1.1 Main Competence 1 : Perform Scientific Investigation and Technological Discovery.**

This competence is built by three specific competences, which are: investigate things that are in the environment, recognize various types of energy and their uses, identify scientific and technological theories.

#### **Specific Competence: Investigate Things that are in the Environment. Importance**

This competence will enable the pupil to build learning skills and to identify living and non-living things that are in the environment. Also the pupil will recognize needs of living organisms and how to solve various problems in our living environment.

This competence will be built by various activities including recognizing of living and non-living things that are in the environment, to take precautions against dangerous or poisonous organisms and to value domestic animals.

#### **Main activity 1: To recognize the living and non-living things that are in the environment.**

Teacher, this competence will be attained by doing the following specific activities. i)

To mention non-living and living things found in the environment.

ii) To use sensory organs to collect and mention all things and living things. iii) To differentiate the living things and non-living things. iv) To mention the characteristics of living things (locomotion, respiration, reproduction)

#### **Teacher's Competence**

Teacher, in this activity you should be competent in:-

- i) Understanding the intended competence to be achieved by the pupils when investigating living and non-living things in the environment.
- ii) To prepare and use charts, diagrams and model concerning the living things and non-living things in the environment.
- iii) To assist pupils to use five sensory organs (hearing, seeing, touching, smelling and tasting) correctly when doing scientific investigation.
- iv) To understand the surrounding environment and teach the pupils how to use it safely.
- v) To guide the pupils to collect the information and keep records about scientific investigation by using numbers, words, pictures and diagrams.

**The importance of investigating living and non-living things in the environment.** To build the competence the teacher can assist the pupils to recognize the surrounding environment and use it correctly when investigating living and non-living things.

## **How to build specific competence on investigating living and non living things that are in the environment.**

**Specific Activity 1: To mention the living and non -living things that are in the environment.**

**Teaching Aids/materials:** Charts, models and diagrams.

### **How to teach**

- a) Lead the pupils to brain storming and mention the living and non living things which are known in the environment and correct their mistakes.
- b) Show the pupils charts, diagrams, models, real objects and lead the pupils to mention the names of living and non living things, then, help them to correct the mistakes.
- c) Lead the pupils to explain in summary what they have learnt.

### **Learning Assessment**

Teacher, by considering assessment criteria, make sure that every pupil is able to mention different living and non living things correctly.

### **Feedback**

The teacher should discuss with the pupils the assessment report in order to form strategies to modify the weakness which occurred in mentioning names of living and non- living things.

**Specific activity 2: To collect and list the living and non living things Teaching**

**Aids/materials:** Living organisms and objects.

### **How to teach**

- a) The teacher should lead the pupils to get out of the class and observe, collect and list living and non-living things.
- b) Lead the pupils to come back to their class and sit in their small groups and then discuss about living things and non-living things which they have been observed. Let the pupils list them.
- c) Lead the pupils to present their group work in the classroom, then correct the mistakes.
- d) Lead the pupils to list living things and non-living things they have learnt in order to conclude the lesson.

### **Learning assessment**

Teacher, by considering the assessment criteria, check if each pupil is able to observe, collect and list things and living things outside the class correctly.

### **Feedback**

Teacher, together with the pupils, discuss the assessment results, then form strategies to modify the weakness occurred in observation, collecting and listing things and living things in the environment outside the class.

**Specific activity 3: To distinguish living and non living things. Teaching**

**aids/materials:** Living things and objects.

### **How to teach**

- a) Lead the pupils to form small groups and discuss about living things and non living things in their environment.
- b) Lead the pupils to present their group work in the class room, then help them to correct the mistakes.
- c) Summarize the lesson by letting each pupil to mention living and non-living things which they have learnt.

### **Learning assessment**

Teacher, by considering assessment criteria, check if each pupil is able to observe, collect and list things and living organisms found in the environment outside the class correctly.

### **Feedback**

Teacher, lead class discussion on the assessment results and form strategies to modify weakness, occurred in observing, collecting and listing things and living organisms found in the environment outside the class correctly.

### **Specific activity 4: To explain characteristics of living organisms**

**Teaching Aids/material:** living organisms (human being, grasshopper, plants)

### **How to teach**

- (a) Lead pupils in small groups to discuss characteristics of living things by observing real organisms such as human being, grasshopper and plants.
- (b) Lead the pupils to present their group work in the class room, then help them to correct their mistakes
- (c) Let the pupils to summarize the lesson by each pupil to mention characteristics of living organisms which they have learnt.

### **Learning assessment**

Teacher, by considering assessment criteria, check if each pupil is able to mention characteristics of living organisms

### **Feedback**

Teacher, discuss the assessment results with your pupils and then set strategies to modify weakness occurred in explaining the characteristics of living things.

### **Main Activity 2: To take precautions of dangerous or harmful organisms in the environment.**

Teacher, this task will be accomplished by performing the following specific activities:i) To mention things and dangerous organisms in the environment. ii) To mention the places where dangerous things and organisms are.

- iii) To perform activities which show how to take precautions against things/dangerous organisms by using special garments and shoes.
- iv) To mention dangerous environment and to explain the importance of using special garments and shoes to protect ourselves against things or dangerous organisms.

### **Teacher's Competence**

Teacher, to accomplish the task of precautions against things or dangerous organism in the environment you are supposed to:-

- i) To understand the competence which is intended to be achieved by the pupils when analysing the precautions to be taken against things/dangerous organisms in the environment.
- ii) Prepare and use the following teaching materials, pictures, drawings, real objects and special garments for the precautions.
- iii) To understand the surroundings so that you can guide the pupils how to use them safely.

**How to build specific competence on how to investigate non living and living things that are in the environment.**

**Specific Activity 1: To list dangerous things and living things in the environment.**

**Teaching aids/materials,** pictures, drawings and real objects.

### **How to teach**

- i) Lead the pupils to form small groups and then give them pictures and drawings of things and living things. Let them discuss and list things and dangerous living things as shown in the drawings.
- ii) Lead the pupils do presentation of their answer to the class. Correct their wrong answers.
- iii) Summarize the lesson by leading each of pupil to mention at least three dangerous things and three dangerous organisms.

### **Learning Assessment**

Teacher, considering the assessment criteria check to see if each pupil has been able to mention things and living organisms using pictures and drawings.

### **Feedback**

Teacher, make discussion with your pupils about the assessment results then set strategies to weaknesses noticed in mentioning things and living organisms.

**Specific Activity 2: To mention the places where dangerous things and living organisms exist**

**Teaching Aids-** Pictures and drawings

### **How to teach**

- i) Lead the pupil to brain storm and mention places where there are things and dangerous organisms by using the given pictures and drawings.
- ii) Lead the pupils to present their group answers to the class and then correct the incorrect answers.
- iii) Lead the pupils to visit school surrounding area in order to identify danger places.
- iv) Guide each pupil to mention danger environment, dangerous things and organisms in their environment.

### **Learning Assessment**

Teacher, taking into consideration the assessment criteria, check if each pupils has been able to mention the environment which has things and dangerous organisms correctly.

### **Feedback**

Teacher, with your pupils, discuss the assessment results and then set strategies to avoid weaknesses found when mentioning things and dangerous organisms found in the environment.



### **Specific Activity 3: Performing actions which indicate how to take precaution of things and dangerous organism by using special garments and shoes.**

**Teaching Aids:-** Special garments and shoes, real objects (including mosquito killer, disinfectant) and real organism such as mosquitoes.

#### **How to teach**

- i) Lead the pupils outside the class, then through role play demonstrate to them how to wear the special garment and shoes, using mosquito killer, toilets disinfectant and to explain to them precautions to be taken when using these insecticides.
- ii) Guide the pupils to form small groups, then each group to demonstrate how to wear garments and special shoes, to spray mosquito killer and how to use toilet disinfectant.
- iii) Assist the pupils in a proper way of wearing the special garments and shoes, spraying mosquito killer and using toilet disinfectant.
- iv) End the lesson by guiding each pupil to explain how to use mosquito killer, toilet disinfectant to wash toilets and how to wear garments and special shoes.

#### **Learning Assessment**

Teacher, using assessment criteria, check if each pupil has been able to wear special garment and shoes, use mosquito killer and use toilets disinfectant to wash toilets correctly.

#### **Feedback**

Teacher, together with the pupils discuss the assessment results and form strategies to modify the weakness occurred on how to use garments and special shoes to protect against dangerous things and organisms in the environment.

**7.1.2 Main competence: Understanding the basics of Science and Technology** This competence is built up of three specific competences such as:- Apply scientific information and communication technology, manage science related skills, and to perform science related practicals correctly.

#### **Specific Competence: Apply Information and Communication Technology**

This competence will enable the pupil to build skills and attitude towards using information and communication technology in her/his learning life. Example of activities in this competence are as follows:

- i) To demonstrate how to use telephone ii) To explain how to use telephone in learning.

#### **Main activity 1: To demonstrate how to use a mobile telephone**

This activity will be achieved by implementing the following specific activities. i)

To explain the differences between mobile and landline telephone.

- ii) To mention precautions to be taken when using telephone.
- iii) Dialling and receiving calls.iv) To send and receive text messages using a mobile phone.
- v) To play telephone games which develop: reading, re-writing and re-arithmetic skills (3Rs) by using a mobile phone.

#### **Teacher's Competence**

In order to accomplish this activity, a teacher should be able to use a mobile phone in the teaching and learning process.

## **How to build specific competence of applying information and communication technology**

**Specific Activity 1:** To explain differences between mobile and landline telephone.

**Teaching Aids/Materials/Needs:** Telephones (landline and mobile) models, chart, diagrams.

### **How to teach**

- i) Lead the pupils to brainstorm and mention differences between landline and mobile telephones and analyse the correct answer.
- ii) By using a wall chart, diagrams and telephone models show the pupils the different between mobile and landline telephone.
- iii) Guide the pupils to summarize the lesson by each pupil to explain differences between mobile and landline telephone.

### **Learning Assessment**

Teacher, when pupils are demonstrating how to use telephone as instructed check how they are doing by considering the assessment criteria.

### **Feedback**

Teacher, discuss with pupils the assessment result and form strategies to correct mistakes occurred in the assessment results if any.

**Specific Activity 2: Mention precautions to be taken when using a telephone.**

**Aids/Materials** Telephone (Mobile or landline), models, charts and drawings.

### **How to teach**

- i) Guide pupils to brain storm and mention the difference between a landline telephone and a mobile phone, then help them to correct mistakes.
- ii) Lead the pupils to form small groups, then use diagrams and charts to mention major parts of a mobile phone and discuss the precautions to take when using phones.
- iii) Lead the pupils to present their group work in the class, then help them to correct mistakes (individually).
- iv) Lead the pupils to summarize the lesson by explaining precaution to be taken when using telephone.

### **Learning Assessment**

Teacher, by considering assessment criteria, check if each pupil is able to explain precautions to be taken when using telephone.

### **Feedback**

Teacher, discuss with pupils the assessment results about precaution to be taken when using telephones. Identify the weakness occurred if any and set with them strategies on how to avoid those weakness.

**Specific Activity 3: To make call and receiving calls**

**Aids/Materials:** Telephone, model, diagrams and charts

### **How to teach**

- (a) Guide the pupils to form small groups, then discuss how to dial and receive a call by using telephone, telephone models while considering stages of dialling and receiving calls as identified in the diagram.
- (b) Lead the pupils to present their group work in the class, then give them instructions how to make and receive calls by using procedures.
- (c) Lead the pupils to perform activities on dialling and receiving calls. Make sure that you involve each pupils.
- (d) Lead the pupils to summarize the lesson for everyone to explain how to dial and receive calls.

### **Learning Assessment**

Teacher, by considering assessment criteria, check if each pupil is able to dial and receive calls.

### **Feedback**

Teacher, discuss with your pupils on the assessment results about the activity of making and receiving calls. Check if there are some weaknesses and look for a way to correct them.

### **Specific Activity 4: To send and to receive text message through mobile phone.**

**Teaching Aids/materials:** Mobile phone models

### **How to teach**

- i) Arrange your pupils into small groups and make sure that each group has a mobile phone model.
- ii) Direct them how to send and receive message. Each pupil must participate in this activity.
- iii) Guide each group to send and receive message which promotes the 3Rs skills. iv) Guide the pupils to demonstrate how to write and send a text message.

### **Learning Assessment**

Teacher, when the pupils are doing the activity of sending and receiving message, check how correct they are according to the type of assessment which has been used.

### **Feedback**

Teacher, discuss with your pupils on the assessment results about the activity of sending and receiving a text message. Check if there are some weaknesses and look for a way to avoid them.

### **Specific activity 5 Playing games which develop reading, writing, and arithmetic (3Rs) and to consider all the skills which can be developed by using phones. Teaching aids and tools:**

Mobile telephones and toys of telephone

### **How to teach**

- (i) Arrange the pupils in small groups and ensure that each group has a telephone.
- (ii) Direct them on how to play games, using the handsets and ensure that each pupil takes part.
- (iii) Lead each group to play games and increase their knowledge of reading, writing and arithmetic (3Rs).
- (iv) Conclude the lesson by asking each pupil to explain how to write and send a message on the phone.

## **Learning assessment**

While the pupils are on the activity of using telephone handsets, assess their performance by the set criteria.

## **Feedback**

Involve the pupils in discussing the results of the assessment. Identify the weaknesses that may have emerged and prepare strategy for avoiding them.

## **Main activity 2: Explain how to use a telephone in learning**

This activity will be accomplished after performing the following specific activities

- (i) Use the telephone to get scientific and technological knowledge.
- (ii) Use the telephone to receive advice and direction.
- (iii) To explain the importance of using telephone in learning
- (iv) Explain procedures of using a telephone in learning

## **Teacher's competence**

To perform this activity successfully you need to know how to use the telephone for teaching and learning.

## **Specific activity 1: Use the telephone to acquire knowledge**

**Teaching Aids/Tools/others** Mobile phone, chart and drawings with instructions on how to use telephone in learning.

## **How to teach**

- (i) Lead the pupils to brainstorm the use of the mobile telephone in learning. The teacher should correct them where they go wrong.
- (ii) Lead the pupils in small groups to discuss the use of the telephone in learning by using the telephone, chart and the drawings you had prepared.
- (iii) Lead the pupils to use the mobile telephone to get scientific and technological knowledge.

## **Learning Assessing**

Make a follow up to see if pupils have a habit of using the mobile telephone to get knowledge, this being one of the criteria of assessment.

## **Feedback**

Let the pupils discuss the results of the learning assessment. Identify the weaknesses that may have emerged and prepare strategy for avoiding them.

## **Specific activity 2: To use the telephone to receive advice and instructions**

**Aids/tools/others:** Mobile phone, chart with illustrations on the use of telephone in learning.

## **How to teach**

- (i) Organize the pupils in small groups. Lead them to use mobile phone to send messages or make calls to request for instructions.
- (ii) Lead all the pupils in the groups to make calls and receive advice on telephone.
- (iii) Lead the pupils to explain how to make calls and receive advice on telephone.

### **Assessing learning**

Considering the criteria of assessment find out if all the pupils are able to use the telephone to learn and seek advice.

### **Feedback**

Discuss with your pupils the results of the assessment then set strategy for correcting the weaknesses that may have emerged.

### **Specific Activity 3: Importance of using a mobile telephone in learning**

**Aids/materials/need:** Mobile telephone, drawings and a wall chart to show the uses of mobile telephone in learning.

#### **How to teach**

- (i) Guide the pupils to mention the uses of mobile telephone and their importance.
- (ii) Lead the pupils to form groups to perform a role play concerning the importance of using a mobile telephone.
- (iii) Lead the pupils in groups to discuss the importance of using mobile telephone.
- (iv) To end the lesson, lead each pupil to understand the importance of using mobile telephone individually.

### **Learning Assessment**

Teacher, considering the assessment criteria, check if every pupil is able to mention importance of using mobile telephone.

### **Feedback**

Together with your pupil, discuss the assessment results, and its weaknesses if any and find also ways to avoid them.

### **7.1.3 Main Competence 3 Health Care and Environment**

This competence consist of three specific competences which are; Apply cleanliness principle to overcome diseases, apply health principles for good health and recognize various systems of the human body. Each specific competence consists of different activities according to the level of the assessment criteria.

#### **Specific Competence: Apply health principle for a good health**

##### **Importance**

This competence will enable the learner to develop health care skills and techniques towards good health which includes balanced diet, various precautions against HIV/ AIDS. Activity that has chosen to be an example is to explain ways of protecting against HIV

## **Main activity 1: Explain ways of protecting against HIV/AIDS**

Teacher, this task will be accomplished only if you are able to do these specific activities:(i)

Avoid sharing sharp objects

(ii) Abstain from unsafe sexual contacts

(iii) Avoid unsafe blood transfusion

(iv) Protection of new born baby from getting HIV infection through the mother.

### **Teachers' competence**

Teacher in order to succeed in you teaching you must have the following competences; to understand clearly methods to avoid HIV, to understand clearly how HIV/AIDS spread.

To recognise and use skills on HIV/AIDS in teaching and learning.

## **How to build specific competence on ways of protecting against HIV/AIDS**

### **Specific activity I: To avoid sharing of sharp objects**

**Teaching Aids/materials:** Real objects/models, wall chart, drawings, razor blade and needles.

#### **How to teach**

I) Guide the pupils to mention sharp objects which prick or cut the skin. Help them to get the correct answers. ii) Guide the pupils in groups to mention sharp objects which can prick or cut the skin. Correct the answers.

iii) Lead the pupils in small group to use a chart and drawings to show how sharp objects can spread HIV/AIDS from an affected person to a person who is not affected and how to avoid this.

iv) End the lesson by guiding each pupil to avoid sharing sharp objects which prick and cut the skin.

#### **Learning Assessment**

Teacher, by considering assessment criteria, check if every pupil has been able to explain how to avoid sharing sharp objects which can prick and cut the skin.

#### **Feedback**

Teacher, discuss with your pupils about the assessment results, and if there are some weaknesses, together find a way to avoid them.

### **Specific Activity 2: Avoid unsafe blood transfusion**

**Teaching Aids/materials:** A wall chart, drawings and posters

#### **How to teach**

i) Using drawings and posters, guide the pupils to explain how HIV/AIDS can be spread through unsafe blood transfusion from HIV/AIDS victim to a person without HIV/AIDS. ii) Guide the pupils in their groups to submit their answers in the class and mark them.

iii) By ending the lesson, lead each pupil to explain how to avoid unsafe blood transfusion.

#### **Learning Assessment**

Teacher, by considering assessment criteria, check if each learner is able to explain the importance of avoiding unsafe blood transfusion.

#### **Feedback**

Teacher, discuss with your pupils about the assessment results, and create a strategy to solve problems if they were there. Identify weaknesses and ways to avoid them.

## **7.2 Examples of Competence Building Process for Standard IV**

This part gives examples of how to develop specific competence in Standard IV.

### **7.2.1 Main competence: To perform scientific investigation and technological discovery.**

This competence is developed by three specific competences that is: Investigate the things that are in the environment, recognize the various types of energy and their uses and identify scientific and technological theories.

#### **Specific competence: Recognize various type of energy and their use**

##### **Important**

The specific competence will enable the pupil to develop an attitude to use various energy according to availability and rules governing the environment. Examples of activities in this competence are:-

- (i) To identify sources of electric energy.
- (ii) Actions indicating characteristics of travelling of lights.

#### **How to develop specific competence on identifying different energy and their uses**

##### **Main activity 1: To identify source of electric energy.**

This task will be achieved by performing the following specific activities: (i)  
To mention sources of electric energy.

- (ii) To explain the uses of electric energy
- (iii) To perform activities which verify the presence of electricity

##### **Teacher's competence**

Teacher in order to develop competence for the pupils about identification of source of electric energy, you must have the following competences; to recognize sources of electricity and their use.

##### **Specific Activity 1: To mention sources of electric energy**

##### **Teaching Aids/materials:**

Electric wire, battery, the sun, generator, water, natural gas, bulb, various things which use electric energy example iron, radio and fan, a wall chart to show the uses of electric energy.

##### **How to teach**

- (i) By using the teaching materials, group the class in small groups and guide them to discuss and use sources of electric energy.
- (ii) Guide the pupils to present their answers to the class. The teacher should assist them by correcting the wrong given answers.
- iii) Ending the lesson by guiding each pupil to mention sources of electric energy.

##### **Learning Assessment**

Teacher, by considering assessment criteria, check if each pupil has been able to mention sources of electric energy and its uses.

**Feedback**

Teacher, discuss with your pupils on the assessment results, and set strategies to avoid weaknesses if they are there.

**Specific Activity 2: To explain the uses of electric energy**

**Aids/materials:** Drawings and wall charts

**How to teach**

- (i) Group the pupils into small groups then by using drawings and charts guide them to discuss the uses of electric energy.
- (ii) Guide the pupils to present their answers to the class while the teacher helps to correct the wrong answers.
- (iii) Lead the pupils to observe the environment in and outside their classroom, then lead them to mention uses of electric energy in their environment.
- (iv) End the lesson by guiding each pupil to mention uses of electric energy.

**Learning Assessment**

Teacher, by considering the assessment criteria, check if each pupil is able to mention the uses of electric energy.

**Feedback**

Teacher, discuss with your pupils on the assessment results and set strategies to avoid weaknesses if they are there.

**Specific activity 3: To perform activities which verify the presence of electric energy**

**Resources/Teaching and learning aids:** Wire, cell, bulb and switch.

**How to teach**

- (i) Guide pupils to brainstorm and discuss the concept of electric energy, to mention electric cables and the uses of electricity.
- (ii) Guide pupils in small groups to prepare the tools which are used to create electric circuit.
- (iii) To guide pupils in groups to create simple electric circuit by using wire, battery, bulb and switch.
- (iv) Guide pupils to discuss the outcome of the experiment (each group should present) after creating the electric circuit, switching on and off the source of power
- (v) By ending the lesson ask pupils questions to be answered individually on the name and the uses of each equipment used. Also, ask them to mention electrical appliances used at home.

**Learning assessment**

By considering assessment criteria make a follow-up to check if each pupil is able to create an electric circuit and mention various electric appliances.

**Feedback**

Teacher, with your pupils, discuss on the assessment results, and set strategies to avoid weaknesses.



**Main Activity 2: Performing the actions to demonstrate how light travelling** This activity will be accomplished by performing these minor activities.

- a) To mention things which allow light to penetrate.
- b) To do actions to indicate how light travels

### **Teacher's Competence**

To accomplish this task, a teacher should be able to perform activities which indicate how light travels scientifically.

### **Specific Activity 1: To mention things which allow light to penetrate.**

**Teaching Aids/Materials:** Lamp, candle stick, mirror, a piece of paper and a table.

### **How to teach**

- (i) Through brainstorming strategy, guide the pupils to mention objects which allow light to penetrate and help them to correct the wrong answers.
- (ii) Group the pupils into small groups and guide them to discuss actions which indicate how light travels by using a lamp, a candle stick mirror, a piece of paper, bottle and a table.
- (iii) Guide the pupils to present their answers to the class while the teacher is set to help them by correcting the wrong answers.
- (iv) End the lesson by guiding everyone to mention objects which allow light to penetrate.

### **Learning assessment**

Teacher, by considering assessment criteria, check if each pupil has been able to mention objects which allow light to penetrate.

### **Feedback**

Teacher, discuss with your pupils on the assessment results. In case there are some weaknesses, find a strategy to avoid.

**Specific activity 2:** Performing the actions to show how light travels **Aids/materials:-** Lamp, candle stick, mirror, bottle, table.

### **How to teach**

- (i) Group the pupils into small groups and then, by using lamp, mirror, candle stick, bottle and table, guide the pupils to show how light travels.
- (ii) End the lesson by leading pupils each one to explain the activity to indicate how light travels by using a lamp, a piece of mirror, a piece of paper, a bottle and a table.

### **Learning assessment**

Teacher, consider the assessment criteria, to check if every pupil has been able to do the actions which indicate how light travels.

### **Feedback**

Teacher, with your pupils, discuss on the assessment results, and set strategies to avoid weaknesses if any.

**7.2.2 Main competence: Understanding the basics of science and technology** This competence consists of three specific competences which are:- Apply information and communication technology, manage science related skills and perform science related practicals correctly.

**Specific competence: Apply Information and Communication Technology (ICT)**

**Importance:**

This competence will enable the pupil to develop skills and attitude to use information and communication technology in his/her life. Examples of activities in this competence is to analyse technological tools which are used to facilitate communication through writings and to perform activities on how to use radio and television.

**Main Activity 1: To analyse technological tools which are used to facilitate communication through writing.**

This activity will be accomplished by performing the following specific activities:(i) To list communication tools that use to prepare the written form communication.

(ii) To explain the uses of the communication tools that use to prepare the written form communication.

**Teacher's competence**

In order to accomplish this task, the teacher should have the ability to identify and use technological tools which are used to perform communication in a written form.

**Specific activity 1: To mention information and communication technology that use to prepare the written form communication**

**Aids/materials:** Wall chart, drawings, computer, typewriter, fax, phone.

**How to teach**

(i) Using brainstorming technique, guide the pupils to mention information and communication technology tools which are used to prepare written form communication. The teacher should write the answers on the board while correcting

the wrong answers.

(ii) Group the pupils into small groups and lead them to observe the tools prepared by the teacher and then let them mention their names.

(iii) Guide the pupils to present their group answers to the class, then assist them by correcting the wrong answers.

(iv) End the lesson by guiding each pupil to mention the information and communication technology tools which are produced in a written form.

**Learning assessment**

By considering the assessment criteria, check if each pupil has been able to mention information and technology tools which are produced in a written form.

**Feedback**

Teacher, discuss with your pupils on the assessment results, and then, set strategies to avoid weaknesses if there any.

**Specific activity 2: To explain the use of information and communication technology tools which are produced in a written form.**

**Teaching Aids/materials:** Wall chart, drawings, typewriter computer, fax and a phone.

**How to teach**

- (i) Group the pupils in small groups and lead them to discuss the uses of the information and communication technology tools which are produced in a written form.
- (ii) Lead the pupils to present their group work in the class. Assist them by correcting the wrong answers.
- (iii) End the lesson by guiding each pupil to explain the uses of information and communication technology tools include mobile phone, typewriter and computer.

**Learning assessment**

Teacher, by considering assessment criteria, check if each pupil has been able to explain the uses of the information and communication technology tools.

**Feedback**

Teacher, discuss with your pupils about the assessment results, and set strategies to avoid weaknesses if they are there.

**Main Activity 2: Performing the actions on how to use a radio and a television** This task will be accomplished by doing the following specific activities.

- (i) To explain precautions to be taken when using a radio and a television and to mention their important parts.
- (ii) To put on and to find channels in a radio and a television.
- (iii) To explain the uses of a radio and a television and to practice playing games which promote reading, writing and arithmetic skills.

**Teacher's competence**

Teacher, you are supposed to have the ability to use a radio and a television in teaching and learning.

**Specific activity 1: Mention parts of a radio and a television**

**Teaching Aids/materials:** Radio, television, drawings to show these parts:- on, off and channel buttons of a radio and television.

**How to teach**

- (i) Guide the pupils through brainstorming strategy to explain precautions to be taken when using a radio and television and to mention their main parts. Teacher to assist them by correcting the wrong answers.
- (ii) Group the pupils into small groups and then lead them to discuss and list parts of a radio and television by using a radio and a television or drawings.
- (iii) Lead the pupils to present their group work to the class and the teacher to assist them in correcting the wrong answers.
- (iv) End the lesson by leading each pupil to explain precautions to be taken when using a radio and television and to mention the important parts of a radio and television.

### **Learning assessment**

Teacher, by considering the assessment criteria, check if each pupil has been able to mention parts of a radio and a television and their uses.

### **Feedback**

Teacher, together with your pupil, discuss the assessment results and set strategies to avoid weaknesses if they are there.

### **Specific activity 2: To put on and to find channels in a radio and a television.**

**Aids/materials:** Radio, television, drawings to show on, off, channel button of a radio and a television.

### **How to teach**

- (i) Lead the pupils in small groups to practice putting on and off, and find channels in a radio and a television.
- (ii) Lead the pupils to present their group work in the class about how to put on and off and look for channels in a radio and a television. Assist the pupils in correcting the wrong answers.
- (iii) Ending the lesson by guiding everyone to practice how to put on and off and to look for a channel in a radio or television.

### **Teaching assessment**

Teacher, by considering the assessment criteria, check if each pupil has been able to put on and off and to look for a channel in a radio or a television.

### **Feedback**

Teacher, discuss with your pupils on the assessment results and then strategies to avoid problems if any.

### **Specific activity 3: To explain the uses of radio and television and practice playing games which develop reading, writing and arithmetic skills.**

**Teaching aids/materials:** Radio, television, drawings which shows off and on parts and how to change radio and television stations.

### **How to teach**

- (i) Lead the pupils in their groups to discuss the uses of radio and television, and then to present their group work and help them to correct mistakes.
- (ii) Lead them in their groups to play various games which promote R<sup>3</sup> skills.
- (iii) Lead the pupils to summarize the lesson by each pupil to explain the uses of radio and television and practices playing games which promote 3Rs skills.

### **Learning assessment**

Teacher, by considering assessment criteria, check if every pupil is able to explain the uses of radio and television and can play games which promote 3Rs skills.

### **Feedback**

Teacher, discuss with the pupils about the assessment results and set strategies to correct the problems if any.

### **7.2.3 Main competence: Health care and environment**

This competence consist of three specific competences which are apply cleanliness principle to overcome diseases, apply health principles for good health and recognize various systems of the human body. Each specific competence consists of different activities according to the level of the assessment criteria.

#### **Specific competence: Recognize various systems of human body**

This competence will enable the pupil to build the skill of health care and environment and recognize the problems of digestive system, and how to avoid them and use proper eating habit.

Examples of activities to build this specific competence are such as:

- (a) To analyse the problems which can occur in the digestive system.
- (b) To explain things which prevent problems in the digestive system.

**Main activities 1: To analyse the problems which may occur in the digestive system**  
**Teacher, this activity will be accomplished by implementation of the following specific activities:-**

- (i) To explain the problems which may occur in the digestive system.
- (ii) To explain the reasons which cause problems in the digestive system.

#### **Teacher's competence**

Teacher, in order to accomplish this activity you should be able to:

- (a) Explain how digestive system takes place.
- (b) Analyse problems which may occur in the digestive system.
- (c) Explain causes of problems in the digestive system.
- (d) Identify and use teaching and learning strategies in the classroom.

**Specific activity 1: To explain the problems which can occur in the digestive system.**

**Aids/materials:** Models, diagrams and wall chart.

#### **How to teach**

- (i) Guide the pupils to brainstorm and mention problems which may occur in the digestive system and help them to correct mistakes.
- (ii) Lead the pupils in their small groups to discuss the problems which may occur in the digestive system by using models, diagrams and various wall charts.
- (iii) Lead the pupils to present the group work in the classroom then help them to correct mistakes.
- (iv) Summarize the lesson by leading each pupil to explain problems which may occur in the digestive system.

#### **Learning assessment**

Teacher, by considering assessment criteria, check if each pupil has been able to explain problems which may occur in the digestive system.

#### **Feedback**

Make sure your feedback will reflect the activity intended to be measured in order to identify success or problems occurred and to modify them.

**Specific activity 2: To explain the causes of problems in the digestive system.**

**Aids/materials:** Models, chart, diagrams

**How to teach**

- (i) Lead the pupils in their small groups and discuss causes of problems in the digestive system by using diagrams and various wall charts.
- (ii) Lead the pupils to present their group works in the classroom and help them to correct mistakes.
- (iii) Conclude the lesson by leading every pupil to explain the cause of problems in the digestive system.

**Learning assessment**

Teacher, by considering the assessment criteria, check if each pupil has been able to explain the causes of problems in the digestive system.

**Feedback**

Teacher, discuss with your pupils about the assessment results and set strategies together to modify the problems.

**Main activity 2: To explain ways of preventing problems in the digestive system**

Teacher, this activity will be achieved by implementing the following specific activities:

- (i) Eat fruits after meal and drink enough water
- (ii) Eat balanced diet and on time
- (iii) Avoid uses of alcohol and drugs abuse.

**Teacher's competence**

Teacher, when teaching this activity, you are supposed to be able to:

- (i) To know way to prevent problems in the digestive system.
- (ii) To identify and use proper techniques of teaching and learning in the classroom.
- (iii) To choose teaching and learning materials/aids appropriately to the activity.

**Specific activity 1**

Eat fruits after meal and drink enough water.

**Aids/materials**

Chart of various types of food, fruits and water.

**How to teach**

- (i) Guide the pupils to brainstorm and mention ways to prevent problems in the digestive system and help them to correct the wrong answers.
- (ii) Lead the pupils to form small groups, then let them discuss the importance of eating fruits and drinking enough water by using charts.
- (iii) Lead the pupils to present their group works in the classroom, then help them correct the wrong answers.
- (iv) Conclude the lesson by everyone to explain the importance of eating fruits after meal and drink enough water.

### **Learning assessment**

Teacher, by considering assessment criteria, check if every pupil has been able to explain the importance of eating fruits after meal and drinking enough water.

### **Feedback**

Teacher, discuss with your pupils about the assessment results and together set strategies to avoid weaknesses which occurred.

### **Specific activity 2: Eat balanced diet on right time.**

**Aids/materials:** Chart of various types of food.

### **How to teach**

- (i) Lead the pupils in their small groups to discuss the importance of eating balanced diet on time by using various charts.
- (ii) Lead the pupils to present the group works in the classroom and help them to correct the mistakes.
- (iii) Conclude the lesson by each pupil to explain the importance of eating balanced diet on time.

### **Learning assessment**

Teacher, by considering the assessment criteria, check if each pupil has been able to explain the importance of eating balance diet on time.

### **Feedback**

Teacher, discuss with your pupils about the assessment results and set together the techniques to modify the weaknesses occurred.

### **Specific activity 3: To avoid alcohol and drug abuse**

**Aids/materials:** A chart showing various alcohol and drugs abuse.

### **How to teach**

- (i) Guide the pupils to brainstorm and mention alcoholic drinks and drugs which are used in dangerous places and help them to correct the wrong answers.
- (ii) Lead the pupils in their small groups and discuss how to avoid the uses of alcohol and drug abuse.
- (iii) Lead the pupils to present the group works in the classroom then help them to correct the mistakes.
- (iv) To conclude the lesson lead each pupil to explain how to avoid the use of alcohol and drug abuse.

### **Learning assessment**

Teacher, by considering assessment criteria, check if each pupil has been able to explain how to avoid the use of alcohol and drug abuse.

### **Feedback**

Teacher, discuss with your pupils about the assessment results and together set the strategies to modify the weakness occurred if any.

## 7.3 Examples of Competence Building Process for Standard V

**7.3.1 Main competence: Perform scientific investigation and technological discovery.** This competence is built by three specific competences such as:- observe things that are in the environment; recognize various types of energy and their uses; identify scientific and technological theories.

### **Specific competence: Investigate things that are in the environment Importance**

This competence, will enable the pupil to develop the ability to investigate and discover things that are in the environment, how to protect it and it's important, examples of activities in this competence is to identify groups of living organisms.

### **Main activity 1: Identify groups of living organisms**

This task will be accomplished by performing these specific activities:

- (i) To mention groups of living organisms.
- (ii) To identify the living organisms habitats
- (iii) To explain the characteristics of each group of the living organism.

### **Teacher's competence**

To accomplish this task, the teacher is supposed to have an ability to identify groups of living organism and their habitants in the environment around.

### **Specific activity 1: To mention groups of living organisms.**

**Aids/materials:** Plant, flower, bird, insect, insect chart, animals and plants chart.

### **How to teach**

- (i) Through brainstorming technique, lead the pupils to mention groups of living organism. Teacher, write the answers on the board and correct the wrong answers.
- (ii) Lead the pupils in their groups to observe plants and insects prepared, and then list the names of the insects.
- (iii) Lead the pupils to present the group work to the class and assist them to correct the wrong answers.
- (iv) Conclude the lesson by guiding each pupil to mention groups of the learnt living organisms.

### **Learning assessment**

Teacher, by considering the assessment criteria conclude the lesson by guiding each pupil to mention the learnt groups of the living organism.

### **Feedback**

Teacher, together with your pupils, discuss the assessment results and then set strategies to avoid weaknesses if any.

### **Specific activity 2: To identify the living organisms' habitants**

**Aids/materials:** Insects, posters, a chart to show an ocean.

### **How to teach**



- (i) Lead the pupils in the groups to discuss the habitants of the groups of living organisms.
- (ii) Lead the pupils in their groups to present their group work in the class and then, assist them to correct the wrong answers.
- (iii) Lead the pupils in their groups to present their group work in the class and then, assist them to correct the wrong answers.

### **Learning assessment**

Teacher, by considering assessment criteria, check if each pupil has been able to explain the habitants of living organisms.

### **Feedback**

Teacher, together, with your pupils discuss on the assessment results, set strategies to avoid weaknesses if any.

### **Specific activity 3: To explain characteristics of each group of the living organisms.**

**Aids/materials:** Seeds, plants, a chart to show animals which lay egg and those which reproduce young ones and a chart to show how different plants produce seeds.

### **How to teach**

- (i) Lead pupils in their groups to mention/explain characteristics of each of the living organisms groups.
- (ii) Guide the pupils in each group to present their group work to the class. Assist them by correcting the wrong answers.
- (iii) Lead the pupils to identify the characteristics of the living organisms which relates to their habitants. Let them present their answers to the class and correct the wrong answers.
- (iv) Lead the pupils to end the lesson by guiding each one to explain characteristics of the living organisms.

### **Learning assessment**

Teacher, by considering the assessment criteria, check if each pupil has been able to explain characteristics of each group of the living organisms.

### **Feedback**

Give the proper feedback which reflects the intended activity so that you can identify the weakness and strength if they are there and deal with them accordingly.

## **7.3.2 Main competence 2: Understanding the basics of science and technology**

This competence is built by three specific competences such as: Apply information and communication technology (ICT); manage science-related skills; perform science related practicals correctly.

### **Specific competence: Manage science-related skills**

#### **Importance**

This competence will enable the pupil to manage scientific skills by using various machines in their environment.

### **Main Activity 1: To identify simple machine**

This activity will be achieved by implementing the following specific activities:

- (i) To explain the meaning of machine
- (ii) To mention types of machines
- (iii) To explain characteristics features of simple machines

### **Teacher's competence**

To accomplish this activity you are supposed to be able to identify and use technological machines which are used to simplify work in the daily life activities.

### **Specific activity 1: Explain types of machine**

Aids/materials: Spoon, knife, needle, razorblade, bush knife.

### **How to teach**

- (i) Guide the pupils to brainstorm and mention simple machines they know.
- (ii) Arrange pupils into small groups to discuss experiments of using simple machine which they have mentioned like bush knife, knife and spoon.
- (iii) Lead the pupils to present their group works by listening to their group presenters.
- (iv) Conclude the lesson by asking everyone to mention simple machine and its uses.

### **Learning assessment**

Teacher, by considering assessment criteria, check if each one has been able to mention simple machines and explain their uses.

### **Feedback**

Teacher, discuss with your pupils the assessment results and together set strategies to correct weaknesses if any.

### **Specific activity 2: To explain characteristics of simple machines**

Aids/materials: Spoon, razorblade, bush knife, knife, a piece of chalk, ruler.

### **How to teach**

- (i) Arrange the pupils into small groups then lead them to use materials/aids prepared to explain characteristics of simple machines.
- (ii) Lead the pupils to present their group works in the classroom then, assist them to correct the wrong answers.
- (iii) Lead the pupils to observe simple machines and list characteristics of simple machines found in their environments, let them present answers in the classrooms then assist them to correct wrong answers.
- (iv) Lead the pupils to conclude the lesson by everyone to mention characteristics of simple machines.

### **Learning assessment**

Teacher, by considering the assessment criteria, check if everyone is able to explain characteristics of simple machine.

### **Feedback**

Teacher, together with pupils discuss about the assessment results and set strategies to correct weaknesses if any.

### **7.3.3 Main competence 3: Health care and environment**

This competence consist of three specific competences which are apply cleanliness principle to overcome diseases, apply health principles for good health and recognize various systems of the human body. Each specific competence consists of different activities according to the level of the assessment criteria.

#### **Specific competence: Apply health principles for good health Importance**

This competence will enable the pupil to develop skills and attitude of observing principles of health care and hygiene in the living environment. Examples of activities in this competence is: To explain the effects of HIV/AIDS.

#### **Main activity 1: Explain the main things to be considered for (ARVs) users**

This activity will be achieved by implemeting the following specific activities:i)

Explain the importance of using ARV to the HIV/AIDS victim.

ii) To concern and care people who use ARV. iii) To explain the importance of Doctor's advice to the people who use ARV.

#### **Teachers' competence**

In order to accomplish this activities teacher is supposed to be able to explain the effect of HIV/AIDS in family, community and the all nation.

#### **Specific activity 1: Explain the importance of using ARV to HIV/AIDS victims**

**Aids/material:** ARV medicine, chart, diagrams and a picture of infected person.

#### **How to teach**

- i) Guide the pupils to brainstorm and mention materials which will help to explain the importance of using ARV to HIV/AIDS victims.
- ii) Lead the pupils in their small groups to observe charts and diagrams.
- iii) Lead the pupils to present their group work in the classroom explain to them the importance of using ARV to HIV/AIDS victims.
- iv) Lead the pupils to conclude the lesson by everyone to explain the importance of using ARV to HIV/AIDS victims.

#### **Learning assessment**

Teacher, by considering the assessment criteria, check if everyone has been able to explain the importance of using ARV to HIV/AIDS victims.

**Feedback** Teacher, discuss with pupils about the assessment results and set strategies to correct the weaknesses if any.

#### **Specific activity 2: To concern and care people who use ARV**

**Aids/material:** ARV medicine, chart, diagrams and pictures

#### **How to teach**

- i) Guide the pupils to brainstorm and mention materials which will help to explain how to care people who use ARV.
- ii) Lead the pupils in their small groups to observe charts and diagrams.

- iii) Lead the pupils to present their group work in the classroom explain to them how to care people who use ARV.
- iv) Conclude the lesson by everyone to explain how to care people who use ARV.

### **Learning assessment**

Teacher, by considering the assessment criteria, check if everyone has been able to explain how to care people who use ARV.

**Feedback** Teacher, discuss with pupils about the assessment results and set strategies to correct the weaknesses if any.

### **Specific activity3: Explain the importance of the doctor's advice to the people who use ARV.**

**Aids/material:** ARV medicine, chart, diagrams and pictures.

### **How to teach**

- i) Guide the pupils to brainstorm and mention materials which will help to mention the importance of the doctor's advice to the people who use ARV.
- ii) Lead the pupils in their small groups to observe charts and diagrams.
- iii) Lead the pupils to present their group work in the classroom explain to them the importance of the doctor's advice to the people who use ARV.
- iv) Lead the pupils to conclude the lesson by everyone to explain the importance of the doctor's advice to the people who use ARV.

### **Learning assessment**

Teacher, by considering the assessment criteria, check if everyone has been able to explain the importance of the doctor's advice to the people who use ARV.

**Feedback** Teacher, discuss with pupils about the assessment results and set strategies to correct the weaknesses if any.

### **Specific competence 3: Recognize various systems of the human body. Importance**

This competence will enable the pupils to understand the concept of excretory system and identify life style which can cause or avoid effects in the excretory system.

### **Main activity 1: Identify life style to avoid problems in excretory system of human body**

Teacher, this activity will be achieved by implementing two specific activities, such as:(i) Mention life style which can avoid problems in the excretory system.

- (ii) Explain continuously lifestyle which can avoid problems in the excretory system.

### **Teacher's competence**

Teacher, in this activity you should be able to:-

- (i) Recognize the competence which is intended to be built when teaching the life style which helps to avoid problems in the excretory system.
- (ii) To prepare chart, pictures, diagrams and magazine about life style which helps to avoid problems in the excretory system.
- (iii) Explain to the pupils the importance of considering correct life style which avoid problems in the excretory system..

## **The importance of recognizing different systems in the human body.**

This competence will enable the pupils to recognize him/her self and understand correctly the structure and functions of the body, especially various body systems and the advantages of the health care in order to strengthen the body system.

## **How to develop specific competence on recognizing different systems in the human body.**

### **Specific activity 1: Mention life styles which help to avoid problems in the excretory system.**

**Aids/Materials/Needs:** Chart of the excretory system, pictures and diagrams about the excretory system.

#### **How to teach**

- (i) Guide pupils to brainstorm and mention various life style which can avoid problems in the excretory system example good habit of:- eating food, drinking water and uses of cosmetics.
- (ii) Lead pupils to present their answers and list them on the blackboard then discuss them.
- (iii) Lead the pupils in their groups to observe pictures/diagrams and mention life style which can avoid problems in the excretory system.
- (iv) Lead pupils to conclude the lesson by everyone to mention life style he/she will consider to avoid problems in the excretory system.

#### **Learning assessment**

Teacher, by considering assessment criteria, check if every pupil has been able to mention various life style which can avoid problems in the excretory system.

#### **Feedback**

Teacher, discuss with pupils about the assessment results and set strategies to correct weaknesses which occurred.

### **Specific activity 2: Explain habitual life style which can avoid problems in the excretory system.**

**Aids/Materials:** pictures, diagrams, journals and newspapers about life styles which prevents the problems in excretory system.

#### **How to teach**

- (i) Lead the pupils in their groups to observe pictures and diagrams and identify life styles which prevent problems in excretory system.
- (ii) Lead the pupils to present their group work in the class then assist them to correct their mistakes.
- (iii) Guide the pupils in their groups to read various journals and explain the life styles which helps to prevent problems in the excretory system.
- (iv) Lead the pupils to present their group work then assist them to correct their mistakes.
- (v) To conclude the lesson lead the pupils by explaining habitual life styles which help to avoid problem in excretory system. In this task every pupil should participate.

#### **Learning assessment**

Teacher, by considering assessment criteria, and the level of understanding of each pupils assist them in explaining the life style which prevent the problems in excretory system.

## **Feedback**

Teacher, discuss with your pupils about the assessment results and set strategies to avoid problems in excretory system.

## **7.4 Examples of Competence Building Process for Standard VI**

This part consists of examples of how to build specific competence in standard VI.

**7.4.1 Main competence: Perform scientific investigation and technological discovery** This competence is built by three specific competences such as observe things that are in the environment; identify various types of energy and their uses; identify scientific and technological theories.

### **Specific competence: Investigate things that are in the environment Importance**

This competence will enable the pupil to build skills and an attitude towards the using of types of soil in their living environment and explain its characteristics and importance. Examples of activities in this competence is to identify characteristics and uses of various types of soil in their environment and to do experiments to identify these types.

#### **Main activity 1: To identify types of soil**

This activity will be achieved by implementing the following specific activities

- (i) To explain the meaning of soil
- (ii) To mention types of soil
- (iii) Explain characteristics of soil
- (iv) Explain the uses of various types of soil

#### **Teacher's competence**

In order to promote learner's skills in identifying types of soil and their uses, you are supposed to be able to recognize various types of soil in the school and home environments.

#### **Specific activity 1: Explain the meaning of soil**

**Aids/Materials:** Soil, water, container

#### **How to teach**

- (i) Guide the pupils to observe the soil and mention things they have observed in the soil and explain the meaning of soil. Teacher you should write on the blackboard then assist them to correct their mistakes.
- (ii) Lead the pupils in their groups to observe soil and mention things they have observed and list them.
- (iii) Lead the pupils to present their group work in the class then assist them to correct mistakes.
- (iv) To conclude the lesson lead the pupils by every pupil to mention things they have observed in the soil.

#### **Learning assessment**

Teacher, by considering assessment criteria, check if every pupil has been able to explain the meaning of soil.

## **Feedback**

Teacher, discuss with your pupils about the assessment results and set strategies to correct the weaknesses if any.

### **Specific activity 2: Mention types of soil**

**Aids/Materials/Needs:** Soil, seeds, water

#### **How to teach**

- (i) Lead the pupils in small groups to discuss on the types of soil, using soil samples.
- (ii) Guide the pupils to present their group work to the class while assisting them to correct mistakes.
- (iii) To conclude the lesson lead the pupils by guiding each pupil to explain types of soil.

#### **Learning activities**

Teacher, by considering the assessment criteria, check if each pupil has been able to explain types of soil.

#### **Feedback**

Teacher, discuss with your pupils on the assessment results and set together strategies to avoid weaknesses if any.

**Specific activity 3: To explain the characteristics of soil** **Aids/Materials/Needs:** Soil, seeds, water and plants.

#### **How to teach**

- (i) Lead the pupils in small groups to discuss on the characteristics of the soil types by using soil, water, seeds and seedlings.
- (ii) Lead the pupils to present their group work to the class, while helping them to correct the mistakes.
- (iii) To conclude the lesson lead each pupil to explain the uses of soil.

#### **Learning assessment**

Teacher, by considering the assessment criteria, check if every pupil has been able to explain the characteristics of the soil.

#### **Feedback**

Teacher, discuss with your pupils about the assessment results, and together set strategies to avoid weaknesses if any.

### **Specific activity 4: Mention types of soil and their uses**

**Aids/Materials/Needs:** Soil, seeds, water and seedling

#### **How to teach**

- (a) Lead the pupils in small groups to discuss on the types of soil and their uses.
- (b) Guide the pupils to present their group work to the class while assisting them to correct mistakes.
- (c) Lead the pupils to conclude the lesson by guiding each pupil to explain types of soil and their uses by using soil, water and seedling.

## **Learning activities**

Teacher, by considering the assessment criteria, check if each pupil has been able to explain characteristics of soil and their uses.

## **Feedback**

Teacher, discuss with your pupils on the assessment results and set together strategies to avoid weaknesses if any.

### **7.4.2 Main competence 2: Understanding the basics Principle of science and technology**

This competence is built by three specific competences such as: Apply information and communication technology (ICT); manage science-related skills; perform science related practicals correctly.

#### **Specific competence: Apply Information and communication technology**

This specific competence will enable the pupil to develop knowledge skills and attitude to use the information and communication technology. An example for activities in this competence is to explain the concept of an internet network.

#### **Main activity1: To explain the concept of internet network.**

This task will be accomplished by performing the following minor activities:a) To explain the concept of an internet.

- b) To explain the uses of an internet.
- c) To explain precautions against the internet network.

#### **Teacher's competence**

Teacher, in order to accomplish this specific teaching tasks, you are supposed to have the skills of using computer in the teaching and learning process.

#### **Specific activity 1: To explain the meaning of an internet**

**Aids/Materials:** Computer, a chart of communication equipments and drawings.

#### **How to teach**

- (i) Through brainstorming strategy, lead the pupils to mention parts of a computer while the teacher will write the answers on the board and to assist them by correcting the mistakes.
- (ii) Lead the pupils in small groups to observe the chart, drawings which show the computer and internet network and then to list the information and communication equipments which they see and then explain the meaning of an internet network.
- (iii) Guide the pupils to present their group work to the class, then assist them by correcting the mistakes.
- (iv) Conclude the lesson by guiding each pupil to explain the meaning of the internet network.

#### **Learning assessment**

Teacher, by considering the assessment criteria, check if each pupil has been able to explain the meaning of an internet network.

#### **Feedback**

Teacher, discuss together with your pupils on the assessment results, then set strategies to avoid weaknesses if they are there.



## **Specific activity 2. Explain the uses of an internet**

**Aids/materials:** Computer, an article on the uses of an internet.

### **How to teach**

- (i) Lead the pupils into small groups and distribute to them articles which shows the uses of an internet and let them to read in their groups. Guide them to write a summary on the uses of an internet network.
- (ii) Guide the pupils to present their group work to the class, and assist them to correct the mistakes.
- (iii) Lead the pupils to conclude the lesson by guiding each pupil to explain precautions against an internet network.

### **Learning assessment**

Teacher, by considering the assessment criteria, check if each pupil has been able to explain the uses of an internet network.

### **Feedback**

Teacher, discuss with your pupils about the assessment results and set strategies to avoid weaknesses if they are there.

## **Specific activity 3: To explain precautions to be taken while using internet network.**

**Aids/materials:** Articles on precautions to be taken while using internet network. **How to teach**

- (i) Lead the pupils in small groups and then distribute to them articles which show precautions to be taken while using internet network, let them read them and write a summary on the precautions against the internet network.
- (ii) Guide the pupils to present their group work to the class, while the teacher is assisting them by correcting the mistakes.
- (iii) Conclude the lesson by guiding each pupil to explain the precautions to be taken while using internet network.

### **Learning assessment**

Teacher, by considering the assessment criteria, check if each pupil has been able to explain the precaution to be taken when using internet network.

### **Feedback**

Teacher, discuss with your pupils about the assessment results and set strategies to avoid weaknesses if any.

## **7.4.3 Main competence: Health care and the environment**

This competence consist of three specific competences which are apply cleanliness principle to overcome diseases, apply health principles for good health and recognize various systems of the human body. Each specific competence consists of different activities according to the level of the assessment criteria

### **Specific competence: Apply health principle for good healthy**

This competence will enable the pupil to understand and observe health rules and principles and therefore develop a healthy community. Among the activities in this competence is to realize health rules, and observing them in the surrounding environment.

**Main activity: To identify hereditary diseases.**

This activity will be accomplished by performing the following specific activities.

- (i) Mention hereditary diseases
- (ii) Distinguish between hereditary and other diseases
- (iii) Explain the cause of hereditary diseases
- (iv) Explain the precaution to be taken by a person who suffers from a hereditary disease.

**Teacher's competence**

In order to accomplish this activity successfully, the teacher should be able to identify hereditary diseases in the community, differentiate between hereditary and other diseases, explain the causes of genetic diseases and the precautions to be taken by a person who suffers from a hereditary disease in the community.

**Specific activities 1: To list hereditary diseases**

**Aids/tools:** Chart listing genetic diseases, pictures of people suffering from hereditary diseases.

**How to teach**

- (i) Let the pupils brainstorm by naming different types of hereditary diseases. The teacher should write on the chalkboard the names of hereditary diseases that were mentioned by the pupils. Correct the pupils if they mention non-hereditary diseases.
- (ii) Lead the pupils to form small groups. Let each group study the chart and pictures of people suffering from genetic diseases. Let them write the names of the diseases in their exercise books.
- (iii) Guide the pupils to present their group work to the class, while the teacher is assisting them by correcting the mistake.
- (iv) Conclude the lesson by guiding each pupil to mention the types of hereditary diseases.

**Learning assessment**

Teacher, by considering the assessment criteria, check if each pupil has been able to mention the types of hereditary diseases.

**Feedback**

Teacher, together with your pupils discuss on the assessment results and then set strategies to avoid weaknesses if they are there.

**Specific activity 2: To distinguish between hereditary diseases and other diseases**

**Aids/materials:** Charts listing genetic diseases, pictures of people suffering from hereditary diseases.

**How to teach**

- (i) To lead the pupils in groups to mention the different between hereditary diseases and other diseases.
- (ii) Guide the pupils in their groups to present their group work to the class. The teacher to correct the mistakes.
- (iii) Lead the pupils to conclude the lesson by guiding each pupil to mention the different between hereditary diseases and other diseases.

### **Feedback**

Teacher, together with your pupils discuss on the assessment results and then set strategies to avoid weaknesses if they are there.

### **Specific Activity 3: To explain sources of hereditary diseases.**

**Aids/materials:** Charts listing genetic diseases, pictures of people suffereng from hereditary diseases.

### **How to teach**

- (i) Lead the pupils to discuss in groups the sources of hereditary diseases.
- (ii) Let each group leader present the group findings to the class. Correct mistakes in the presentations.
- (iii) Conclude the lesson by each pupil to explain the sources of hereditary diseases.

### **Assessment of learning**

Using the assessment criteria find out if all the pupils are able to explain the sources of hereditary diseases.

### **Feedback**

Ensure that the feedback is related to the specified activity so that you can determine the success or weaknesses which emerged and correct such weakness in the future.

### **Specific activity 4: To explain precautions to take for a person suffering from hereditary diseases.**

**Aids/materials:** Pictures to show hereditary diseases victims. A chart to show hereditary diseases.

### **How to teach**

- (i) Lead the pupils in their groups to mention precautions to take against a person suffering from hereditary diseases.
- (ii) Guide the pupils to present their group work to the class, while the teacher is assisting them by correcting the wrong answers.
- (iii) Conclude the lesson by assisting each pupil to explain precaution to take against a person affected by hereditary disease.

### **Learning assessment**

Teacher, by considering the assessment criteria, check if every pupil has been able to explain the precautions to be taken against a person suffering from hereditary diseases.

**Feedback**

Teacher, discuss with your pupils on the assessment results and set strategies together to avoid weaknesses if any.

## References

- B.A. Mena, (2007) **Science for Primary School Book One**. Vision Publishers, Limited, Dar as Salaam.
- C. Caligula, H. Kalama, (2013). **Science for Standard III**. University Press Tanzania Ltd. Dar as Salaam.
- Daff, S.K. (2013) **Science Oasis for Standard V**. Jared book house, Dar as Salaam.
- J. Malatya, G. Manzoni, D. Cornel (2009). **Sustainerable Science, Pupil's book for Standard III**. Longhorn publishers, Dar es Salaam.
- Institute of Education Tanzania (2013) **Teacher's Guide for Teaching Science in Tanzania Primary Schools**. TIE, Dar es Salaam.
- TIE (2010). Teacher's Guide for **Teaching Information and Communication Technology for Tanzania Primary Schools**. Second Edition, Dar es Salaam.
- TIE (2010). Teacher's Guide for **Teaching Science Subjects in Tanzania Primary Schools**, Second Edition, Dar es Salaam.
- Ministry of Education Science, Technology and Vocational Training (2015) **Science and Technology Syllabus for Basic Education Standard III**, TIE, Dar es Salaam.

**ATTACHMENT 1**

**CLARIFICATION TABLE FOR COMPETENCE, MAIN ACTIVITY AND SPECIFIC ACTIVITY FOR STANDARD III – VII**

**STANDARD III**

Main Competence	Specific Competence	Main Activity	Specific Activities
		(a) To recognize living and non living things that are in the environment.	(i) To mention living and non living things. (ii) To identify living organisms found in the environment by using the five sensory organs. (iii) To distinguish living and non living things. (iv) To perform actions which indicate characteristics of living organisms. (v) To explain characteristics of living organisms. (vi) To explain the importance and uses of living and non living things in the environment.
		(b) To explain how to take precautions and safety against dangerous or poisonous organisms	(i) To mention dangerous things and organisms in the environment`. (ii) To mentions places where there are dangerous things and living organisms. (iii) To perform actions which indicate how to take precautions against dangerous things or living organisms. (iv) To explain the importance of using special tools when taking precautions against dangerous or poisonous organisms.
		(c) To explain how to value living and non living organisms found in the environment.	(i) To explain the importance of living and non living things in the environment. (ii) To explain how to take care of the living organisms. (iii) To protect and care things and living organisms.
	1.2 Recognize various types of energy and their uses.	(a) To explain the concept of energy.	(i) To explain the meaning of energy. (ii) To mention type of energy (sound, heat and light energy) (iii) To explain the importance of sound, heat, and light energy.

			(iv) To explain the uses of sound, heat and light energy energy.
--	--	--	--

Main Competence	Specific Competence	Main Activity	Specific Activities
		(b) To demonstrate how the sound, heat and light energy travel.	(i) To perform activities which indicate characteristics of sound energy. (ii) To perform activities which indicate characteristics of heat energy. (iii) To perform activities which indicate characteristics of light.
		(c) To explain the uses of sound, heat and light energy.	(i) Explain the uses of sound energy (ii) Explain the uses of heat energy. (iii) Explain the uses of light energy.
		(a) To explain the concept of matters.	(i) To explain the meaning of matter. (ii) To mention types of matter. (iii) To explain the importance of matter. (iv) To explain the uses of matter.
		(b) To perform activities about characteristics of matter.	(i) To explain three states of matter and their uses. (ii) To perform activities to show the presence of air. (iii) To mention thing which float and sink in water. (iv) To mention things which can fly and float in the air.
		(c) To make a model which can fly and float in air and water	(i) To make models which can float on water. (ii) To make models which can fly and float on air. (iii) To make models which can sink and float on water.

2. Understand the basics of Science and Technology.	2.1 Apply Information and Communication Technology. (ICT)	(a) To explain the concept of communication	(i) To explain the meaning of communication. (ii) To mention ways of communication (iii) To explain the importance of the ways of communication. (iv) To explain the uses of the ways of communication.
---	---	---	--

Main Competence	Specific Competence	Main Activity	Specific Activities
		(b) To demonstrate how to use a mobile telephones.	(i) Explain the difference between a landline telephone and a mobile telephone. (ii) Mention precautions to be taken when using a mobile telephone. (iii) To dial and receive telephone. (iv) Sending and receiving message using a mobile telephone.  (v) Playing games which develop Reading, Writing and Arithmetic (3R's) by using telephone.
		(b) To explain how to use a telephone in learning	(i) To use a phone to acquire knowledge of science and technology. (ii) To use a phone to receive counselling and instructions. (iii) To explain the importance of using telephone in learning (iv) Explain procedures of using a telephone in learning.
		(a) To identify tools used to simplify work.	(i) To mentions tools which simplify work. (ii) To differentiate the tools used to simplify work. (iii) To explain the characteristics of tools used to simplify work.



		(b) To do activities of using tools for simplifying work.	(i) To mention the precautions measures which should be taken, when using tools to simplify work. (ii) To explain different ways of using tools which simplify work. (iii) Using tools which simplify work.
		(c) To practice on how to keep tools used to simplify work.	(i) To explain how to care for machines which simplify work. (ii) To list clean and safe storage places for machines and tools. (iii) To care for tools by applying lubricants.

Main Competence	Specific Competence	Main Activity	Specific Activities
		(a) To explain the concept of measurement in doing scientific experiments.	(i) To mention informal measurements. (ii) To mention formal measurements. (iii) To differentiate formal and informal measurements.
		(b) To do activities of using non standard measurement in scientific experiment.	(i) To measured different objects by using nonstandard measurements. (ii) To measure volume of different objects using nonstandard measurements. (iii) To measure weight of different objects by using nonstandard measurements
		(c) To do activities of using standard measurement in scientific experiment.	(i) To measured different objects by using standard measurements. (ii) To measure volume of different objects using standard measurements. (iii) To measure weight of different objects by using standard measurements.

3. Health care and environment.	3.1 Apply principles of cleanliness to overcome diseases.	(a) To explain the importance of body and garments cleanliness.	(i) To mention things which are used to clean body and garments. (ii) To explain the importance of using tools for body and garments cleanliness. (iii) To explain the benefit of doing body and garments cleanliness.
		(b) To keep safe the tools used to clean the body and garments.	(i) To explain precautions to take when using the body and garments tools. (ii) To mention clean and safe place for keeping the body and garments tools. (iii) To explain the importance of keeping the body and garments cleaning tools

Main Competence	Specific Competence	Main Activity	Specific Activities
		(c) To show the habits of maintain body and garments cleanliness and smartness.	(i) To be clean and smart. (ii) To iron clothes (iii) To cut nails. (iv) To cut the hair short and comb it. (v) To brush teeth.
		(d) To explain the concept of First Aid.	(i) To explain the meaning of first aid. (ii) To explain things to be considered when giving first aid to victims. (iii) To explain the importance of giving first aid.
		(e) To demonstrate how to give first aid to a person who has been bitten by dangerous or poisonous insects.	(i) To mention tools used to give first aid to a person who has been bitten by dangerous or poisonous insects. (ii) To explain precautions to be taken during giving first aid to a person who has been bitten by dangerous or poisonous insect. (iii) To practice giving first aid to a person who has been bitten by dangerous or poisonous insects.

3.2 Apply health principles for good health.	(a) To explain the concept of balanced diet	(i) Explain the meaning of balanced diet. (ii) To mention groups of food which form balanced diet. (iii) Explain the importance of getting a balanced diet.
	(b) To perform activities of arranging food which form a balancing diet.	(i) To identify the foods according to their groups. (ii) Arrange foods to get a balanced diet. (iii) Prepare foods which provide a balanced diet.
	(c) Explain ways of protecting against HIV.	(i) Avoid sharing of sharp objects. (ii) Abstain from unsafe sexual contacts. (iii) Avoid unsafe blood transfusion (iv) Protection of new born baby from getting HIV infection through the mother

Main Competence	Specific Competence	Main Activity	Specific Activities
	3.3 Recognize various systems in human body.	(a) To explain the concept of the digestive system.	(i) To explain the meaning of digestive system. (ii) To explain how the digestive system operates. (iii) To explain the importance of digestive system.
		(b) To identify parts of the digestive system.	(i) To mention parts of the digestive system. (ii) To draw the diagram of the digestive system. (iii) To explain function of parts of the digestive system.

## DARASA LA IV

Main Competence	Specific Competence	Main Activity	Specific Activities
		(a) To identify actions which destroy the environment.	(i) To mention safe environment for living organisms. (ii) To explain the effects of environmental pollution (iii) To mention actions which destroy the environmental safety. (iv) To explain actions which destroy and those which do not destroy safety to the living organisms.
		(b) To show the habit of maintain cleanliness and air safety.	(i) To show the habit of protecting the environment. (ii) To apply proper ways of maintaining cleanliness. (iii) To use principles of protecting the environment.
		(c) To perform activities which verify the important needs for the living organisms.	(i) To give explanation on the important needs for living organisms. (ii) To perform activities which verify the importance of water, air, heat and light to the living organisms. (iii) To perform activities which verify the importance of soil to the living organisms.
		(a) To identify sources of the electrical energy.	(i) To explain the meaning of electrical energy. (ii) To mention sources of electrical energy. (iii) To explain the uses of electrical energy. (iv) To perform experiments which indicate the presence of electrical energy.
		(b) To identify things which allow light to pass through by doing activities.	(i) Name things which allow light to pass through. (transparent objects). (ii) Identify things which (allow transparent object) and do not allow light to pass through (opaque objects) (iii) Do activities to show how light is reflected.

Main Competence	Specific Competence	Main Activity	Specific Activities
		(c) To do activities which show how shadows occur.	(i) Explain the meaning of shadow (ii) Explain how a shadow is formed. (iii) Activities to create shadows
		(a) To perform activities about three states of water.	(i) To mention three states of water. (ii) Perform activities which indicate three states of water [gas, liquid, solid]. (iii) Explain the characteristics of each state. [Solid, liquid, gas] (iv) Explain how changes of state of water used.
		(b) To do experiment on freezing point of water.	(i) Explain the meaning of freezing point. (ii) Perform activities which show freezing point of water. (iii) Do experiment which indicate the freezing point of water (iv) Explain the importance of freezing point of water.
		(c) To do experiment on boiling point of water.	(i) Explain the meaning of boiling point. (ii) Perform activities which show the boiling point of water. (iii) Do experiment which indicate the boiling point of water (iv) Explain the importance of boiling point of water.
		(a) Identify means of communication.	(i) Mention communication means (ii) List tools of information and communication technology. (iii) Explain the uses of tools for information and communication technology.
		(b) Perform activities on how to use radio and a television.	(i) Mention parts of radio and television. (ii) Explain precautions to be taken when using radio and television. (iii) To put on and off a radio and a television. (iv) Put on and find channels in a radio and a television.

Main Competence	Specific Competence	Main Activity	Specific Activities
			(v) Practice playing games which promote learning skills of reading, writing and arithmetic (3Rs). (vi) Explain the uses of a radio and a television.
		(c) To value tools of information and communication technology.	(i) Explain the importance of using radio and television. (ii) Explain how to keep radio and television. (iii) To demonstrate how to keep radio and television.
		(a) Explain precautions to be taken when using various types of cookers and refrigerator.	(i) Mention types of cookers. (ii) Explain the importance of cookers (iii) Explain things to consider when using a cooker and a Refrigerator. (iv) Explain how to keep a cooker and a refrigerator. (v) Explain the importance of keeping cookers and refrigerator.
		(b) Demonstrate how to use a cooker	(i) Explain uses of cookers (ii) Name important parts of a cooker (iii) To make fire for cooking purpose.
		(c) Demonstrate how to use a refrigerator (fridge)	(i) Name the important parts of a refrigerator (fridge) (ii) Explain the uses of a fridge (iii) To do activities of turning on and use a fridge. (iv) Explain the importance of using refrigerator.
	2.3 Perform science- related practicals correctly.	(a) Explain the concept of scientific experiment	(i) Explain the meaning of a scientific experiment. (ii) Explain the purpose of a scientific experiment (iii) Explain the importance of scientific experiments.

Main Competence	Specific Competence	Main Activity	Specific Activities
		(b) Identify the steps of doing a scientific experiment	<ul style="list-style-type: none"> <li>(i) Name the steps of doing a scientific experiment.</li> <li>(ii) Explain the importance of each step.</li> <li>(iii) Explain the differences between the steps.</li> </ul>
		(c) Do experiments on the needs of living things.	<ul style="list-style-type: none"> <li>(i) Do experiments on the need of water, air, warmth and light, sound energy.</li> <li>(ii) Do experiments on the need of soil to living things</li> <li>(iii) Analyse the results of the experiments</li> <li>(iv) Explain the results of the experiments.</li> </ul>
		(a) To identify the sources of dirtiness and waste product in environment.	<ul style="list-style-type: none"> <li>(i) Mention sources of dirtiness and waste product in the industries, homes, mining and in hospitals.</li> <li>(ii) Mention types of waste products.</li> <li>(iii) Explain effects of waste products for living organisms in the environment.</li> </ul>
		(b) To indicate the habit of maintaining cleanliness at home and school environment.	<ul style="list-style-type: none"> <li>(i) Explain the importance of environmental cleanliness at home and school.</li> <li>(ii) Explain how to encourage others to perform cleanliness.</li> <li>(iii) Perform environment cleanliness at home and school.</li> </ul>
		(c) To demonstrate how to give first aid to a person who has fainted	<ul style="list-style-type: none"> <li>(i) Explain the procedure of giving first aid to a person who has fainted.</li> <li>(ii) Demonstrate the steps of giving first aid to a person who has fainted.</li> <li>(iii) Explain importance of giving first aid to a fainted victim.</li> </ul>

Main Competence	Specific Competence	Main Activity	Specific Activities
		(a) To identify the infectious and non-infectious diseases.	(i) List down the infectious diseases. (ii) List down non infectious diseases. (iii) Differentiate between infectious and non infectious diseases. (iv) Explain ways to prevent against infectious and non infectious diseases.
		(b) To identify ways of protecting and control eruption diseases..	(i) Mention way of preventing and controlling against eruption diseases. (ii) Explain how to control the eruption diseases. (iii) Explain how to take precautions against eruption diseases.
		(c) To explain the concept of body immunity.	(i) Explain the meaning of body immunity. (ii) Explain the effects of lacking body immunity. (iii) Explain the symptoms of lacking body immunity. (iv) Explain the effects of HIV transmission. (v) Mention or list down important food for HIV/AIDS victim.
		(d) To show the habit of caring and respecting HIV and AIDS victims	(i) Explain the meaning of stigmatization (ii) Explain how to eliminate stigmatization for HIV/AIDS victims. (iii) To show how to care the HIV/AIDS victims.
	3.3 Recognize various systems in human body.	(a) Explain defects which may occur in the digestive system.	(i) Mention problems in the digestive system. (ii) Explain the source of problems in the digestive system. (iii) Explain the symptoms of problems in the digestive system.



Main Competence	Specific Competence	Main Activity	Specific Activities
		(b) Explain ways to prevent occurrence of the problems in the digestive system.	<ul style="list-style-type: none"> <li>(i) Explain ways to prevent occurrence of the problems in the digestive system.</li> <li>(ii) Explain the causes of habits which prevent occurrence of problems in the digestive system.</li> <li>(iii) To practice good habit which hinder problems associated in digestive system.</li> </ul>
		(c) Demonstrate proper eating habits	<ul style="list-style-type: none"> <li>(i) Explain the importance of eating properly.</li> <li>(ii) Explain what to consider during eating properly.</li> <li>(iii) Explain proper eating habits.</li> </ul>

## STANDARD V

Main competence	Specific competence	Activity	Specific activities
		(a) To identify groups of living organisms	<ul style="list-style-type: none"> <li>(i) Mention groups of living things.</li> <li>(ii) Identify the habitat of living things.</li> <li>(iii) Explain characteristics of each group of living things.</li> </ul>
		(b) Explain how a plant make its food [photosynthesis]	<ul style="list-style-type: none"> <li>(i) Explain the meaning of photosynthesis.</li> <li>(ii) Mention main parts of a plant.</li> <li>(iii) Do an experiment to observe the main parts of a plant.</li> <li>(iv) Differentiate main parts of a plant.</li> <li>(v) Explain how photosynthesis takes place.</li> </ul>
		(c) Explain the concept of reproduction in animals and plants	<ul style="list-style-type: none"> <li>(i) Explain the meaning of reproduction in animals.</li> <li>(ii) Explain the meaning of reproduction in plants.</li> <li>(iii) Mention reproductive organs in plants and animals example flower, male and female organs.</li> <li>(iv) Explain how reproduction take place in animals and plants.</li> <li>(v) Perform an experiments to observe changes in flowers.</li> </ul>
		(d) Explain interdependence between living things in the environment.	<ul style="list-style-type: none"> <li>(i) Explain living and non living environment.</li> <li>(ii) Explain how living organisms depend each other. environment.</li> <li>(iii) Perform activities which shows interdependent between living things.</li> <li>(v) Explain effects of destroying the environment.</li> </ul>

Main competence	Specific competence	Activity	Specific activities
		(e) To explain the concept of adaptation of living things according to their environment.	<ul style="list-style-type: none"> <li>(i) Explain the meaning of adaptation of living organisms.</li> <li>(ii) Explain the external features of living things in relation to their habitat.</li> <li>(iii) Perform activities to observe adaptation in animals and plants.</li> <li>(iv) Observe how living things [plants and animals] adapt themselves in their environment.</li> <li>(v) Explain the benefits of living things in adapting their environment.</li> </ul>
		(a) Demonstrate the use of concave and convex lenses	<ul style="list-style-type: none"> <li>(i) Describe a lens</li> <li>(ii) Types of lenses</li> <li>(iii) Demonstrations using lenses</li> <li>(iv) Making lenses</li> <li>(v) Advantage and disadvantages of using lenses.</li> </ul>
		(b) To do experiments about series and parallel electrical circuits.	<ul style="list-style-type: none"> <li>(i) Explain the meaning of electrical circuit.</li> <li>(ii) Explain types of electrical circuits.</li> <li>(iii) Mention tools which form the electrical circuits.</li> <li>(iv) To do experiments of connecting series and parallel electrical circuits.</li> <li>(v) To do an experiment of measuring electrical circuit and voltage.</li> </ul>
		(c) To perform actions to show magnetic principles.	<ul style="list-style-type: none"> <li>(i) Explain the meaning of magnet.</li> <li>(ii) Mention magnetic poles.</li> <li>(iii) Explain the magnetic principles.</li> </ul>

Main competence	Specific competence	Activity	Specific activities
			<ul style="list-style-type: none"> <li>(iv) Do experiments by using magnetic principles.</li> <li>(v) Explain the uses of a magnet.</li> <li>(vi) Explain how to keep a magnet.</li> </ul>
		(d) Demonstrate the behavior of light when it falls on plain mirror	<ul style="list-style-type: none"> <li>(i) Demonstrate the formation of images on a plain mirror.</li> <li>(ii) Investigate images formed by a plain mirror.</li> <li>(iii) Explain the use of plain mirrors.</li> </ul>
		(a) Explain forces that cause changes in matter	<ul style="list-style-type: none"> <li>(i) Explain the meaning of force.</li> <li>(ii) Explain types of force.</li> <li>(iii) Explain the uses of force.</li> <li>(iv) Explain the importance of force in daily life.</li> </ul>
		(b) To perform activities to show how forces cause changes in matter.	<ul style="list-style-type: none"> <li>(i) To perform activities by using various forces.</li> <li>(ii) To observe force in the changes of matter.</li> <li>(iii) To explain the uses of force in the changes of matter.</li> </ul>
		(c) Explain the concept of chemical and physical changes.	<ul style="list-style-type: none"> <li>(i) Explain the meaning of chemical and physical change.</li> <li>(ii) To do experiments showing physical and chemical changes.</li> <li>(iii) Explain the different between physical and chemical change.</li> <li>(iv) Explain the uses of physical and chemical changes.</li> </ul>
2. Understanding the basics of science and technology.	2.1 Apply information and communication technology (ICT)	(a) Explain the concept of computer.	<ul style="list-style-type: none"> <li>(i) Explain the meaning of computer.</li> <li>(ii) Identify parts of a computer</li> <li>(iii) Explain the importance of computer.</li> </ul>

			(iv) Explain the uses of computer.
--	--	--	------------------------------------

Main competence	Specific competence	Activity	Specific activities
		(b) Explain the precautions to be taken when using a computer	(i) Mention computer devices which protect it during operation. (ii) Explain the functions of devices which protect a computer. (iii) To perform activities of connecting major parts of a computer. (iv) To identify computer programs. (v) To explain how to handle a computer properly.
		(c) To perform activities of using a computer word processing program.	(i) To practice how to start and shut down a computer system. (ii) To practice writing by using word processing program.
			(iii) To practice how to save files in a computer. (iv) Explain the uses of a word processing program.
		(d) To perform activities of using a computer game program to promote learning skills including 3Rs	(i) To mention types of games (ii) To play games in order to promote 3R's skills (iii) To play games in order to promote scientific and technological skills.

	2.2 Manage science related skills	(a) Identify simple machine.	(i) Explain the meaning of machine. (ii) Explain types of machine (iii) Explain characteristics features of simple machine.
		(b) To perform activities of using simple machine.	(i) To mention simple machine which are used at home and school (ii) To do activities to invent simple machine.

Main competence	Specific competence	Activity	Specific activities
			(iii) To perform practice of using simple machine example scissors, crow bar and hammer.
		(c) To do experiments showing efforts, load and fulcrum on a lever.	(i) Explain the meaning of lever. (ii) To perform activities to identify effort, load and fulcrum. (iii) To explain the uses of lever.
		(a) To do experiments on heat energy	(i) Explain how to measure heat energy. (ii) Perform experiment to identify the degree of hotness of water. (iii) To perform experiment of measuring body temperature
		(b) To do experiments on light energy by using concave and convex mirror	(i) Explain characteristics of convex and concave mirror (ii) To do experiments by using convex and concave mirror. (iii) Explain the uses of convex and concave mirror

		(c) To do experiments on light energy by using concave and convex lens.	<ul style="list-style-type: none"> <li>(i) Explain the concept of lens.</li> <li>(ii) Perform activities of using lens.</li> <li>(iii) Explain advantages and disadvantages of using lens.</li> <li>(iv) Explain uses of lens.</li> </ul>
3. Health care and environment.	3.1 Apply cleanliness principles to overcome diseases.	(a) To maintain cleanliness and smartness of body and clothes.	<ul style="list-style-type: none"> <li>(i) Explain how to perform body and garments cleanliness.</li> <li>(ii) Explain the importance of body and garments cleanliness.</li> <li>(iii) To avoid habits which can effect the cleanliness of body and garments.</li> <li>(iv) To show body and garments cleanliness habits.</li> </ul>

Main competence	Specific competence	Activity	Specific activities
		(b) To perform actions which destroy insects which transmit diseases	<ul style="list-style-type: none"> <li>(i) To mention types of insects which transmit diseases.</li> <li>(ii) To list items which are used to kill harmful insects</li> <li>(iii) To explain ways used to kill insects which transmit diseases.</li> <li>(iv) To use various ways to kill harmful insects</li> </ul>
		(c) To give First Aid to a person burnt by fire or hot fluid.	<ul style="list-style-type: none"> <li>(i) Mention needs and tools which are used to give First Aid to a person who has been burnt by fire or hot fluid.</li> <li>(ii) Explain precautions to take when rendering First Aid to fire accidents.</li> <li>(iii) Perform activities of giving First Aid to a person who has been burnt by fire or hot fluid.</li> </ul>

3.2 Apply health principles for good health.	(a) To identify health principles.	(i) Name health principles. (ii) Explain how to observe health principle. (iii) Demonstrate observation of health principles (iv) Explain the importance of observing health principles.. (v) Explain the habit which enable to be healthier.
	(b) To explain the concept of eruption diseases.	(i) Explain the causes of eruption diseases. (ii) Mention eruption diseases. (iii) Explain the symptoms of eruption diseases. (iv) Explain effects of eruption diseases

Main competence	Specific competence	Activity	Specific activities
		(c) Explain means in which eruption diseases spreads. diseases.	(i) Mention situations which can cause eruption diseases. (ii) Mention ways of spreading eruption diseases. (iii) Explain how eruption diseases can occur. (iv) Explain how to prevent eruption diseases.
		(d) Explain main things to be considered for Ant retrovirus (ARVs) users.	(i) Explain the benefit of using ARV (ii) Concern and care people who use ARV (iii) Explain the importance of using ARV to HIV/ AIDS victims. (iv) Explain the importance of the doctor's advice for people on ARV.



	3.3 Recognize various systems in human body.	(a) To explain the concept of excretory system in the human body.	<ul style="list-style-type: none"> <li>(i) To explain the meaning of excretory system in human body.</li> <li>(ii) To identify parts of human excretory system.</li> <li>(iii) To explain the importance of the human excretory system.</li> <li>(iv) To explain how the excretory system operates in the human body.</li> <li>(v) To draw a diagram of the excretory system.</li> </ul>
		(b) To identify life styles which can cause problems in the excretory system of human body.	<ul style="list-style-type: none"> <li>(i) To identify problems in excretory system of the human body.</li> <li>(ii) To explain sources and symptoms of problems in the excretory system of the human body.</li> </ul>

Main competence	Specific competence	Activity	Specific activities
			<ul style="list-style-type: none"> <li>(iii) To mention life styles which can cause problems in the excretory system of the human body.</li> <li>(iv) To explain how to avoid the life styles which can cause problems in the excretory system of the human body.</li> </ul>

	(e) To identify proper life styles to avoid problems in the excretory system of the human body.	(i) To mention life styles which help to avoid problems in the excretory system of the human body. (ii) To explain habitual life style which can help to avoid problems in the excretory system of the human body. (iii) To explain how to avoid the life style which may cause problems in the excretory system of the human body.
--	---	---

### STANDARD VI

Main competence	Specific competence	Activity	Specific activities
		(a) To identify gases which form air components.	(i) To explain the meaning of air. (ii) To mention gases which form air. (iii) To explain the characteristics of the gases which form air. (iv) To explain the uses of air.
		(b) To identify essential needs for plant growth.	(i) To mention the important needs for a plant growth. (ii) To explain the effects of lack any of the important needs of a plant growth. (iii) Explain how the conditions for plant growth are obtained
		(c) Perform an experiment to verify how photosynthesis takes place.	(i) Perform experiment to verify the needs of sunlight to plant. (ii) Perform experiment to verify the importance of green leaves in plant. (iii) Perform experiment to verify the needs of oxygen gas to plant.

	(c) To identify types of soil.	(i) Explain the meaning of soil. (ii) Name the types of soil. (iii) Explain characteristics of soil. (iv) Explain the use of the different type of soils.
	(e) To identify activities which cause soil effects.	(i) Name indicators of the activities which lead to damage of soil. (ii) Mention the activities which lead to damage of soil. (iii) Explain how the activities which lead to damage of soil are carried out.

Main competence	Specific competence	Activity	Specific activities
		(f) Perform soil conservation activities.	(i) Explain soil conservation activities. (ii) Explain what to observe in soil conservation. (iii) Explain the importance of conserving soil. (iv) Demonstrate how to conserve soil.
		(a) To perform activities which prove the Ohm's laws in electrical current.	(i) To explain precautions to be taken in performing an experiment to prove the Ohm's law in electrical current. (ii) To perform an experiment on measuring an electricity in the electric circuit using <ul style="list-style-type: none"> <li>· Series circuit and</li> <li>· Parallel circuit</li> </ul> (iii) To explain the importance of the experiment to prove Ohm's law.

		(b) To explain the concept of protecting circuit and buildings against high voltage of electricity.	<ul style="list-style-type: none"> <li>(i) To explain the meaning of high voltage electricity.</li> <li>(ii) To mention devices used to protect circuit and buildings against high voltage of electricity (e.g. fuse, circuit breaker).</li> <li>(iii) To explain the importance of protecting circuit and buildings against high voltage electricity.</li> <li>(iv) To perform activities on how to protect circuit and building against high voltage of electricity.</li> </ul>
--	--	---	---

Main competence	Specific competence	Activity	Specific activities
		(c) To explain the concept of renewable energy.	<ul style="list-style-type: none"> <li>(i) To explain the meaning of renewable energy.</li> <li>(ii) To mention sources of renewable energy.</li> <li>(iii) To explain how to obtain renewable energy.</li> <li>(iv) To explain the properties of renewable energy.</li> <li>(v) To explain uses of renewable energy.</li> </ul>
		(d). To explain how to generate electrical energy	<ul style="list-style-type: none"> <li>(i) To explain how to generate electrical energy by using water.</li> <li>(ii) To explain how to generate electrical energy by using solar energy.</li> <li>(iii) To explain how to generate electrical energy by using wind.</li> <li>(iv) To explain how to generate electrical energy by using biogas.</li> </ul>

		(e) To explain the concept of complex machine.	<ul style="list-style-type: none"> <li>(i) To explain the meaning of a complex machine.</li> <li>(ii) To mention examples of complex machines.</li> <li>(iii) To perform activities of using complex machines.</li> <li>(iv) To explain characteristics of complex machines.</li> </ul>
	1.3 Identify scientific and technological theories.	(a) To do experiments on physical and chemical changes	<ul style="list-style-type: none"> <li>(i) To explain properties of physical and chemical changes.</li> <li>(ii) To perform experiments on physical change by using water.</li> <li>(iii) To perform activities on chemical changes.</li> <li>(iv) To explain the importance of chemical and physical changes</li> </ul>

Main competence	Specific competence	Activity	Specific activities
		(b) To do activities on diffusion.	<ul style="list-style-type: none"> <li>(i) To explain the meaning of diffusion.</li> <li>(ii) To explain the importance of diffusion</li> <li>(iii) To perform activities on diffusion.</li> <li>(iv) To explain the effects which may occur in diffusion.</li> </ul>
		(c) To do experiments on osmosis.	<ul style="list-style-type: none"> <li>(i) To explain the meaning of osmosis.</li> <li>(ii) To explain the importance of osmosis.</li> <li>(iii) To perform an activity to prove the process of osmosis.</li> </ul>

2. Understanding the basics of science and technology.	2.1 Apply Information and Communication Technology (ICT)	(a) To perform activities of using excel program	<ul style="list-style-type: none"> <li>(i) Explain the meaning of excel program.</li> <li>(ii) Explain things to consider when preparing excel program</li> <li>(iii) Explain precautions to be taken when using excel program.</li> <li>(iv) Perform activities on opening on and closing excel program.</li> <li>(v) Perform activities of preparing budget by using excel.</li> </ul>
		(b) Explain the concept of security of internet network.	<ul style="list-style-type: none"> <li>(i) Explain the meaning of internet.</li> <li>(ii) Explain the uses of internet</li> <li>(iii) Explain precaution against internet network</li> <li>(iv) Explain the meaning of internet network safety.</li> <li>(v) Explain things to consider when using internet network..</li> </ul>
		(c) Explain effects of internet network	<ul style="list-style-type: none"> <li>(i) Explain effects of internet network in: Destroying morals and ethics of the society</li> </ul>

Main competence	Specific competence	Activity	Specific activities
			<ul style="list-style-type: none"> <li>(ii) To explain the effects of internet network in destroying morals in the society through wrong informations.</li> <li>(iii) Explain how to avoid the effects which can occur in the internet network.</li> </ul>

	(d) Explain the concept of e-mail.	<ul style="list-style-type: none"> <li>(i) Explain the meaning of e-mail.</li> <li>(ii) Explain the importance of e-mail.</li> <li>(iii) Explain the uses of e-mail.</li> <li>(iv) Explain effects which might be occurred when using e-mail.</li> </ul>
	(e) To practice how to use e-mail.	<ul style="list-style-type: none"> <li>(i) Explain precautions to be taken when using e-mail.</li> <li>(ii) Perform activities of registering him/her self in e-mail.</li> <li>(iii) Perform activities of using e-mail in communication.</li> </ul>
	(f) Perform activities using search engine to find scientific and technological information	<ul style="list-style-type: none"> <li>(i) Mention types of search engine.</li> <li>(ii) Perform activities of finding information by using search engine.</li> <li>(iii) Explain the importance of using search engine.</li> </ul>
	(g) To show the habit of finding scientific and technological information by using telephone and computer	<ul style="list-style-type: none"> <li>(i) Perform activities of finding scientific and technological information by using telephone and computer.</li> <li>(ii) To perform activities of analysing scientific information by using mobile phone and computer.</li> <li>(iii) To practice presenting scientific and technological information by using telephone and computer.</li> </ul>

Main competence	Specific competence	Activity	Specific activities
		(a) Identify simple machine (pulley wheel).	<ul style="list-style-type: none"> <li>(i) Explain the meaning of simple machine.</li> <li>(ii) Mention types of simple machine (Pulley wheel)</li> <li>(iii) Explain the uses of simple machine (Pulley wheel).</li> <li>(iv) Perform activities by using model of pulley wheel.</li> </ul>
		(b) Do calculation on pulley simple machines.	<ul style="list-style-type: none"> <li>(i) Perform the activities of calculating mechanical advantages.</li> <li>(ii) Perform activities of calculating velocity ratio.</li> <li>(iii) Perform activities of calculating efficiency of machine.</li> </ul>
		(c) To explain the concept of work.	<ul style="list-style-type: none"> <li>(i) To explain the meaning of work scientifically.</li> <li>(ii) To explain how to calculate work done.</li> <li>(iii) To demonstrate how to perform work scientifically.</li> <li>(iv) To perform activities which show how to calculate work done.</li> </ul>
		(a) To perform experiments on electrical energy.	<ul style="list-style-type: none"> <li>(i) To perform an experiment to indicate electric current.</li> <li>(ii) To perform an experiment to indicate electrical voltage of a cell.</li> <li>(iii) To perform an experiment to find resistance.</li> </ul>
		(b) To perform activities on how to produce electricity through dynamo and a cell.	<ul style="list-style-type: none"> <li>(i) To mention devices used in the experiment on how to generate electricity energy by using a dynamo and a cell.</li> </ul>



Main competence	Specific competence	Activity	Specific activities
			(ii) To explain precautions to be taken when performing an experiment on how to generate an electrical energy by using a dynamo and a cell. (iii) To perform an experiment on how to generate an electrical energy by using a dynamo and a cell. (iv) To explain the importance of the experiment on how to generate an electrical energy by using a dynamo and a cell. (v) To perform activities to make an electric bell.
		(c) To do experiments about renewable energy	(i) To mention components which form biogas machinery system (ii) To explain function of each part which form biogas machinery system (iii) To create simple biogas for home use (iv) To explain the uses of biogas
		(a) To explain the importance of maintaining cleanliness and smartness of garments.	(i) To explain the importance of maintaining smartness of garments. (ii) To perform activities which indicate how to maintain cleanliness and smartness of garments. (iii) Explain how to maintain garments cleanliness.
		(b) To identify sources of dirtiness and waste products.	(i) To mention types of dirtiness and waste products. (ii) To differentiate type of dirtiness and waste products.

Main competence	Specific competence	Activity	Specific activities
			<ul style="list-style-type: none"> <li>(iii) To mention sources of dirtiness and waste products.</li> <li>(iv) To explain effects of dirtiness and waste products</li> <li>(v) To explain how to avoid dirtiness and waste products.</li> </ul>
		(c) To perform first aids activities	<ul style="list-style-type: none"> <li>(i) Explain ways of giving first aid to a person who is vomiting; has diarrhoea; drowning in water; has been bitten by snake.</li> <li>(ii) Demonstrate activities of giving first aid to a person who has vomiting and diarrhoea.</li> <li>(iii) Demonstrate activities of giving first aid to a person who has a fracture born</li> <li>(iv) Demonstrate activities of giving first aid to a person who has drowning in water.</li> <li>(v) Demonstrate activities of giving first aid to a person who has been bitten by snake</li> </ul>
		(a) Explain the importance of cleanliness and safety of diet to HIV/AIDS Victims..	<ul style="list-style-type: none"> <li>(i) Explain the meaning of diet.</li> <li>(ii) Identify the things to consider when preparing diet for HIV/AIDS victims.</li> <li>(iii) Explain the importance of diet for HIV/AIDS victims</li> </ul>

	(b) Explain the relationship between sexual transmitted diseases and HIV.	(i) Mention sexual transmitted diseases. (ii) Explain how HIV/AIDS is spread. (iii) Explain the effect of sexual transmitted diseases.
--	---	--

Main competence	Specific competence	Activity	Specific activities
		(c) Explain the effects of HIV/AIDS.	Explain the effect of HIV/AIDS in the: (i) Family. (ii) Society (iii) Nationally.
		(d) Identify the hereditary diseases	(i) To list hereditary diseases (ii) Differentiate between hereditary diseases and other diseases. (iii) Explain the source of hereditary diseases. (iv) Explain precautions to be taken for a person having hereditary diseases.
		(e) Identify various groups of people who need health services.	(i) Mention health services in the society. (ii) Mention different groups of people who need health services. (iii) Explain characteristics of each group which need health services.

	3.3 Recognize various system in human body.	(f) To identify the blood circulation system.	<ul style="list-style-type: none"> <li>(i) To explain the meaning of blood.</li> <li>(ii) To mention parts of the blood circulation system.</li> <li>(iii) To draw a diagram of the blood circulation system.</li> <li>(iv) To explain how the blood circulation system works.</li> <li>(v) To explain the importance of the blood circulation system.</li> <li>(vi) To explain the relationship between the blood circulation system and the digestive system.</li> </ul>
--	---	---	--

Main competence	Specific competence	Activity	Specific activities
		(g) To identify problems which may occur in the blood circulation system.	<ul style="list-style-type: none"> <li>(i) To mention problems which may occur in the blood circulation system.</li> <li>(ii) To explain sources and symptoms of problems which may occur in the blood circulation system.</li> <li>(iii) To explain the habit which may cause problems in the blood circulation system.</li> <li>(iv) To explain sources of the habits which may cause problems in the blood circulation system</li> </ul>
		(h) To identify the reproductive system	<ul style="list-style-type: none"> <li>(i) To explain the meaning of the reproductive system in plants and animals.</li> <li>(ii) To mention parts of the reproductive system in plants and animals.</li> <li>(iii) To explain the importance of the reproductive system in living organisms.</li> </ul>

		(d) To identify problems which may occur in the female and male reproductive systems.	<ul style="list-style-type: none"> <li>(i) To explain sources of problems which may occur in the reproductive system (plants and animals).</li> <li>(ii) To explain problems which may occur in the reproductive systems (female and male).</li> <li>(iii) To explain symptoms of problems which may occur in the reproductive system.</li> </ul>
--	--	---	---

Main competence	Specific competence	Activity	Specific activities
		(e) To explain the concept of puberty.	<ul style="list-style-type: none"> <li>(i) To explain the meaning of puberty.</li> <li>(ii) To identify changes caused by puberty in girls and boys.</li> <li>(iii) To explain how to control changes in puberty in boys and girls.</li> </ul>
		(f) To identify ways of family plan	<ul style="list-style-type: none"> <li>(i) To explain the meaning of family plan.</li> <li>(ii) To explain the importance of family plan.</li> <li>(iii) To explain ways of family plan.</li> <li>(iv) To explain symptoms of pregnancy.</li> <li>(v) To explain good moral and ethics.</li> </ul>

## STANDARD VII

Main competence	Specific competence	Activity	Specific activities
1.0 Performing investigations and discoveries in science and technology	1.1 Investigating various things that are in the environment	Identifying and differentiating various warning signs in a specific environment	<ul style="list-style-type: none"> <li>i. To explain the meaning of environment</li> <li>ii. To explain ways of conserving the environment</li> <li>iii. Lists various warning signs found in the specific environment</li> <li>iv. (iv)Explains various warning signs found in specific</li> </ul>
	1.2 Differentiating the uses of warning signs in different environment	Uses of warning signs in different environments have been differentiated clearly	<ul style="list-style-type: none"> <li>v. Mentions the warning signs in different Environment</li> <li>vi. Mentions the uses of warning signs in different environment</li> </ul>
	1.3 Explaining how to generate electricity using water tides	Generation of electricity by using water tides has been explained clearly	vii. Mentions the characteristics of sites suitable for building tidal electricity plant
	1.4 Explaining how to generate electricity using geothermal energy	Generation of electricity by using geothermal energy has been explained correctly	viii. Mentions the suitable sites for generating electricity using geothermal energy

	1.5 Evaluating the quality of renewable energy as compared to other sources of energy	The quality of renewable energy as compared to other sources of energy have been evaluated clearly and relevant examples given	ix. Lists various sources of energy
2.0 <b>Understanding the fundamentals of science and technology</b>	2.1 Using Information and Communication Technology (ICT)	a) Analysing the types of antenna or dish used in various devices	i. Analyze Types of antenna or dish used in various devices
		b) Evaluating the quality of antenna or dish used in various devices based on their characteristics	ii. The quality of antenna or dish used in various devices have been evaluated based on their characteristics
		c) Identifying the types and importance of the materials used to make an antenna or dish	iii. Identify the Types and importance of the materials used in making an antenna or dish have
		d) Creating a model of an antenna or dish correctly using relevant procedures	iv. create An antenna or dish model
	2.2 Mastering of scientific skills	a) Analysing the structure of a complex machine	v. The structure of a complex machine
		b) Using complex machines and apply the skills in using other complex machines	vi. Complex machines vii. types of complex machines
		c) Demonstrating the procedures for maintaining	viii. The procedures for maintaining complex

		complex machines	ix. demonstrate complex machine
		a) Identifying sources of fire and performing experiments to show fire extinguishing methods	x. perform experiments to show fire extinguishing methods
		b) Performing experiments to identify the characteristics of acids and bases	xi. Experiments for identifying the characteristics of acids and bases have been performed correctly
		c) Performing experiments to identify necessary conditions for rusting to occur and how to prevent rusting	xii. Perform Experiments to identify the necessary conditions for rusting and ways of preventing rusting
<b>3.0 Maintaining health and the environment</b>	3.1 Following principles of hygiene for good health and environment	a) Explaining the benefits of waste disposal and give relevant examples	i. Explain The benefits of waste disposal
		b) Verifying steps of waste disposal	ii. give Steps of waste disposal
		c) Describe the incinerator and the types of waste to be incinerated	iii. Incinerators and types of waste to be incinerated have been described correctly
	3.2 Following health principles for good health	a) Distinguishing diets according to the needs of specific groups of people	iv. Distinguish Diets according to the needs of specific groups of people correctly using



			relevant examples
		b) Describing the importance of physical exercises to different groups of people	v. The importance of physical exercises to different groups
		c) Identifying the effects of not performing physical exercises on different groups of people	vi. Identify The effects of not performing physical exercises on different groups of people and give examples
		a) Describing the functions of sense organs in the human body with relevant examples	vii. Different functions of sense organs in the human body have been correctly described with relevant examples
		b) Explaining the relationship between different parts of the nervous system of the human being	viii. The relationship between ix. different parts of the nervous system of the human being has been explained correctly
		c) Elaborating the disorders affecting the nervous system of the human being	x. The disorders affecting the nervous system of the human being and how to avoid them have been correctly elaborated
		d) Elaborating with diagrams	xi. The respiratory system have been correctly

		the respiratory system	elaborated with diagrams
		e) Performing an experiment to show how the respiratory system works	xii. Experiment to show how respiratory system works has been performed correctly
		f) Elaborating with examples the causes of respiratory disorders and ways to avoid them	xiii. The causes of respiratory disorders and ways to avoid them have been elaborated with relevant examples