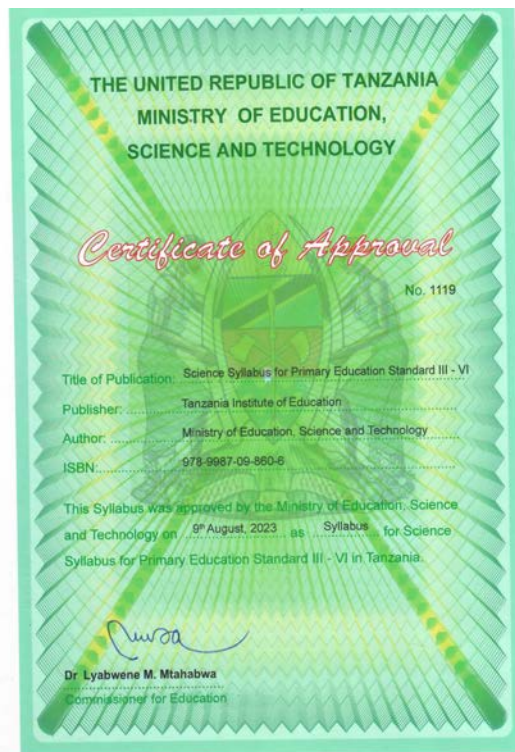


**THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY**



SCIENCE SYLLABUS FOR PRIMARY EDUCATION

STANDARD III–VI

2023

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Table of Contents

List of Tables	v
Abbreviations and Acronyms.....	vi
Acknowledgements.....	vii
1.0 Introduction.....	1
2.0 Main Objectives of Education in Tanzania.....	1
3.0 Objectives of Primary Education Standard III - VI.....	2
4.0 General Competences for Primary Education Standard III - VI.....	2
5.0 Main and Specific Competences.....	3
6.0 Roles of Teacher, Pupil and Parent/Guardian in the Teaching and Learning.....	4
6.1 The teacher.....	4
6.2 The pupil	5
6.3 The Parent/Guardian.....	5
7.0 Teaching and Learning Methods.....	6
8.0 Teaching and Learning Resources.....	6
9.0 Assessment.....	6
10.0 Number of Periods.....	7
11.0 Contents of the syllabus.....	7

Standard III	8
Standard IV	16
Standard V	26
Standard VI	33
Bibliography	42

List of Tables

Table 1: Main and Specific Competences for Standard III–VI..... 3

Table 2: Detailed Contents for Standard II..... 8

Table 3: Detailed Contents for Standard IV..... 16

Table 4: Detailed Contents for Standard V..... 26

Table 5: Detailed Contents for Standard VI..... 33

Abbreviations and Acronyms

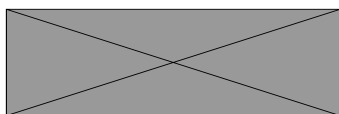
ICT Information and Communication Technology

TIE Tanzania Institute of Education

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Dr Aneth A. Komba
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1.0 Introduction

Science is a compulsory subject for all pupils in Primary Education from Standard III-VI. The significance of teaching and learning Science is to enable the pupils to develop the science competences that are useful in day to day activities. The subject further enables pupils to build confidence, develop communication, critical thinking, problem solving and logical thinking skills. Through learning science, the pupils will demonstrate mastery of scientific theories, elementary scientific and ICT skills. Furthermore, it is expected that the pupil will be able to design simple computer programmes.

The Science syllabus, is designed to guide teaching and learning of Science subject for standards III—VI in Tanzania Mainland. The syllabus interprets the competences indicated in the 2023 Primary Education Curriculum.. It provides information that will enable teachers to plan their teaching processes effectively and help learner to develop the intended competences. In addition, the teaching and learning activities are designed in a manner that helps the pupil to develop 21st century skills including creativity, collaboration, communication, critical thinking and problem solving.

2.0 Main Objectives of Education in Tanzania

The main objectives of providing education in Tanzania are to enable Tanzanians to:

- (a) Develop and improve his or her personality so that he or she values himself or herself and develops self-confidence;
- (b) Respect the culture, traditions and customs of Tanzania; cultural differences; dignity; human rights; attitudes and inclusive actions;
- (c) Apply science and technology, creativity, critical thinking, innovation, cooperation, communication and positive attitudes for his or her development and the sustainable development of the nation and the world at large;
- (d) Understand and protect national values, including dignity, patriotism, integrity, unity, transparency, honesty, accountability and the national language;
- (e) Develop life and work-related skills to increase efficiency in everyday life;
- (f) Develop a habit of loving and valuing work to increase productivity and efficiency in production and service provision;

- (g) Identify and consider cross-cutting issues, including the health and well-being of the society, gender equality, as well as the management and sustainable conservation of the environment; and
- (h) Develop national and international cooperation, peace and justice in accordance with the Constitution of the United Republic of Tanzania and international conventions.

3.0 Objectives of Primary Education Standard III - VI

The objectives of Primary Education Standard III–VI are to:

- (a) Develop reading, writing, and arithmetic skills, communicate fluently, using Tanzanian Sign Language (TSL) and tactile communication;
- (b) Master, appreciate and use Kiswahili and English Language and at least one other foreign language;
- (c) Appreciate and maintain Tanzanian culture, and national unity and recognising other people’s cultures;
- (d) Develop knowledge, the ability to inquire, think critically, design and solve problems.
- (e) Promote moral values, integrity, and respect for differences of /in faith;
- (f) Identify and develop talents, gifts, work skills, sports and arts;
- (g) Develop the habit of appreciating/valuing and loving work;
- (h) Recognise and use science and technology in learning and daily life;
- (i) Develop knowledge, skills and inclination to take care of the environment, respect gender equality and other cross-cutting issues; and
- (j) Develop the ability to socialise in an inclusive environment.

4.0 General Competences for Primary Education Standard III - VI

The general competences for Primary Education, Standard III–VI are to:

- (a) Develop reading, writing, and arithmetic skills and communicate fluently using Tanzanian Sign Language (TSL) and

tactile communication;

- (b) Use and appreciate Kiswahili and English Language. Also, the pupil should be encouraged to develop competence in at least one other foreign language depending on the school situation;
- (c) Appreciate and maintain Tanzanian culture and national unity and acknowledge other people's cultures;
- (d) Develop knowledge, inquisitive mind, critical thinking, creativity and problem-solving skills;
- (e) Promote ethics, integrity, and respect for differences in faith;
- (f) Identify and develop talents, gifts, work skills, sports and arts;
- (g) Develop the habit of valuing and loving work;
- (h) Recognise and use science and technology in learning and daily life;
- (i) Develop knowledge, skills and attitude towards taking care of the environment and respect gender equality, as well as other cross-cutting issues; and
- (j) Develop the ability to interact in an inclusive environment.

5.0 Main and Specific Competences

The main and specific competences to be developed are presented in Table 1.

Table 1: *Main and Specific Competences for Standard III–VI*

Main competence	Specific competence
1.0 Demonstrate mastery of scientific theories	1.1 Demonstrate an elementary understanding of scientific theories 1.2 Make simple scientific observations 1.3 Demonstrate a basic understanding of types of energy and their uses

Main competence	Specific competence
2.0 Demonstrate mastery of elementary scientific skills	2.1 Conduct elementary scientific experiments
3.0 Demonstrate mastery of ICT skills	3.1 Use ICT for learning
4.0 Design simple computer programmes	4.1 Design simple computer programmes

6.0 Roles of Teacher, Pupil and Parent/Guardian in the Teaching and Learning

Good relationships between a teacher, pupil and parent or guardian are fundamental to ensuring successful teaching and learning. This section outlines the roles of each participant in facilitating effective teaching and learning science.

6.1 The teacher

The teacher is expected to:

- (a) Help the pupil to learn and acquire the intended competences in science;
- (b) Use teaching and learning approaches that will allow the pupil to:
 - i. develop the competencies needed in the 21st century;
 - ii. actively participate in the teaching and learning process;
- (c) Use learner centred instructional strategies that make the student a centre of learning including those which allow pupils to think, reflect and search information from various sources. Other strategies include practical work, research, scientific experiments, group discussion and project works. Projects should be those which are geared toward proposing solutions to real life problems;
- (d) Create a friendly teaching and learning environment;

- (e) Prepare and improvise teaching and learning resources;
- (f) Conduct formative assessment regularly by using tools that assess theory and practice including brainstorming, checklist, experiments, questionnaires, face to face questions, classroom exercises, individual and group practicals, projects and portfolios. Other tools include tests, classroom presentations, mid-term, term and annual examinations;
- (g) Treat all pupils equally irrespective of their differences;
- (h) Protect the pupil while at school;
- (i) Keep track of the pupil's daily progress;
- (j) Identify individual pupil's needs and provide the right intervention;
- (k) Involve parents/guardians and the society at large in the pupil's learning process; and
- (l) Integrate cross-cutting issues and ICT in the teaching and learning process.

6.2 The pupil

The pupil is expected to:

- (a) Develop the intended competences by participating in various learning activities inside and outside the classroom;
- (b) Actively engage in the teaching and learning process; and
- (c) Participate in the search for knowledge from various sources, including textbooks, reference books and other publications in online resources such as electronic libraries.

6.3 The Parent/Guardian

The parent/guardian is expected to do the following:

- (a) Monitor the child's academic progress;

- (b) Where possible, provide the child with the needed academic support;
- (c) Provide the child with a safe and friendly home environment that is conducive for learning;
- (d) Keep track of the child progress in behaviour;
- (e) Provide the child with any materials required in the learning process; and
- (f) Instil in the child a sense of commitment and positive value towards education.

7.0 Teaching and Learning Methods

The teaching and learning methods are instrumental in developing pupil's intended competences. This syllabus suggests teaching and learning methods for each activity. They are aimed at enabling pupils to interact with content, which includes listening to and/or watching live or recorded materials, engaging with written or visual texts, and engaging with multimedia. All these aim to help pupils develop listening, speaking, reading, and writing skills as well as develop vocabulary and grammar. However, a teacher is advised to use other appropriate methods based on the environment or context.

8.0 Teaching and Learning Resources

The process of teaching and learning requires different resources. In that regard, both the teacher and pupil should work together to collect or improvise alternative resources available in the school and home environment when needed. The teacher and pupil are expected to constantly seek for information from various sources to effectively facilitate teaching and learning process. The list of approved teaching and learning resources for references should be provided by the Tanzania Institute Education.

9.0 Assessment

Assessment is an important process in the learning and teaching process to facilitate the development of intended competences. The assessment of the Science subject will involve continuous and summative assessment. The continuous assessment will take into account the criteria in each learning activity and will enable the teacher to determine the pupil's learning ability

and needs. It will also help the teacher to assess pupil's knowledge, skills and attitudes, and the ability to appreciate, narrate and apply skills to manage their surroundings. Furthermore, the assessment information will enable the teacher to improve teaching and learning to facilitate the pupil's achievement of the intended outcomes. The assessment tools that will be used during teaching and learning are checklists, classroom exercises, home works, questionnaires, face-to-face questions, practical works (individual and group works), project works and portfolios and other similar tools.

The final assessment will include weekly, monthly, terminal and annual examinations which will be used to assess pupil's learning progress. This assessment information will also be used to assess pupil's progress, but it will also provide feedback to facilitate teaching and learning process. In addition, there will be a standard six national assessment that will contribute 7.5% marks to the Form Four National Examination.

10.0 Number of Periods

The Science Syllabus for Primary Education Standard III—VI provides estimates of the time that will be spent in teaching and learning, in consideration of the complexity of the specific competences and the learning activities. Therefore, seven periods of 40 minutes each have been allocated for this subject per week for Standard III and IV and six periods of 40 minutes each have been allocated for this subject per week for Standard V and VI.

11.0 Contents of the syllabus

The contents of this syllabus are presented in matrix form with seven columns which include main competences, specific competences, learning activities, suggested teaching and learning methods, assessment criteria, resources and the number of periods as presented in Tables 2–5.

Standard III

Table 2: Detailed Contents for Standard III

Main competences	Specific competences	Learning activities	Suggested teaching and learning methods	Assessment criteria	Suggested resources	Number of periods
1.0 Demonstrate mastery of scientific theories	1.1 Demonstrate an elementary understanding of scientific theories	(a) Explain the concept of science (<i>meaning and branches of science</i>)	<p>Brainstorming: Guide the pupils in groups through brainstorming ideas on the concept of science</p> <p>Group discussion: Facilitate group discussions for pupils to share their experiences on the concept of science</p> <p>Questions and answers: Guide the pupils through questions and answers to explain the concept of science</p>	The concept of science is clearly explained	Science kit and videos/animations showing branches of science	44

Main competences	Specific competences	Learning activities	Suggested teaching and learning methods	Assessment criteria	Suggested resources	Number of periods
			<p>Role-play: Guide the pupils through role-play that includes the meaning of science and its branches to explain the concept of science</p> <p>Scenario: Provide scenarios to assist the pupils to discuss the concept of science</p>			
		(b) Describe the human sensory organs	<p>Brainstorming: Guide the pupils in groups through brainstorming ideas on the human sensory organs</p>	Human sensory organs are clearly explained	Diagrams, pictures, charts showing human sensory organs and models of the human sensory organs	

Main competences	Specific competences	Learning activities	Suggested teaching and learning methods	Assessment criteria	Suggested resources	Number of periods
			<p>Group discussion: Guide the pupils in groups through sharing their experiences on human sensory organs</p>			
	1.2 Make simple scientific observations	(a) Identify different objects in the environment	<p>Investigation: Guide the pupils in groups through investigation to identify different objects in the environment</p>	Different objects in the environment are correctly identified	Science kit, source of heat, source of sound, stones, plants, animals and non-living things found in the environment	44
		(b) Identify living and non-living things	<p>Scientific investigation: Guide the pupils to identify the characteristics of living and non-living things through scientific investigations</p>	Living and non-living things are correctly identified	Plants, animals and non-living things such as stones, videos, animations, simulations, pictures showing	

Main competences	Specific competences	Learning activities	Suggested teaching and learning methods	Assessment criteria	Suggested resources	Number of periods
			<p>Group discussion: Guide the pupils through sharing their understanding and experiences on the characteristics of living and non-living things</p> <p>Questions and answers: Ask the pupils to identify living and non-living things through guiding questions</p>		animals and non-living things found in the environment	
		(c) Identify the main groups of living things (<i>plants and animals</i>)	<p>Inquiry-based learning: Ask the pupils through inquiry-based learning to identify main groups of living things found in their environment</p> <p>Questions and answers: Guide the pupils to</p>	Main groups of living things are clearly identified	Plants, animals, diagrams, pictures and charts showing plants, animals	

Main competences	Specific competences	Learning activities	Suggested teaching and learning methods	Assessment criteria	Suggested resources	Number of periods
			identify groups of living things through guiding questions			
2.0 Demonstrate mastery of elementary scientific skills	2.1 Conduct simple scientific experiments	(a) Describe basic steps in conducting a scientific investigations	<p>Questions and answers: Guide the pupils through questions and answers to explain the meaning of scientific investigations</p> <p>Group discussion: Guide the pupils through discussing the basic steps for conducting scientific investigations</p> <p>Inquiry-based learning: Guide pupils through conducting simple investigations in their environment</p>	Step for conducting scientific investigations are clearly described	Ruler, notebook, pencil, weighing balances, stopwatch, tape measure, beaker, measuring cylinder, basin, tin, basket, bucket and sack	43

Main competences	Specific competences	Learning activities	Suggested teaching and learning methods	Assessment criteria	Suggested resources	Number of periods
		(b) Conduct elementary experiments on various living and non-living things	<p>Hands-on activities: Organise activities for pupils to perform various elementary experiments on characteristics and needs of living and non-living things in their environment</p>	Elementary experiments on various living and non-living things are correctly conducted	Plants, animals, stones, football, books and some sand	
		(c) Care for living things in the environment	<p>Brainstorming: Guide the pupils through brainstorming on the proper ways of caring living things in the environment</p> <p>Group discussion: Guide the pupils through discussing the importance of living things and ways of caring them in the environment</p>	Living things are cared correctly in the environment	Gardern of flowers, vegetables, trees and animals	

Main competences	Specific competences	Learning activities	Suggested teaching and learning methods	Assessment criteria	Suggested resources	Number of periods
			<p>Gallery walk: Guide the pupils through gallery walk to investigate the importance of living things and ways of caring them in the environment</p> <p>Project work: Guide the pupils through carrying out a project of caring living thing</p>			
3.0 Demonstrate mastery of ICT skills	3.1 Use ICT for learning	(a) Use ICT to play simple games that promote ability to explain scientific phenomena and concepts	<p>Discussion: Guide the pupils through discussing procedures for playing simple games using ICT</p>	ICT is used properly to play simple games	Smart phones, computer, tablet, television, camera, printer and scanner	44

Main competences	Specific competences	Learning activities	Suggested teaching and learning methods	Assessment criteria	Suggested resources	Number of periods
			<p>Demonstration: Guide the pupils through interactive demonstrations to play simple games using ICT</p> <p>Hands on activities: Guide the pupils through playing different games using ICT</p>			

Standard IV

Table 3: *Detailed Contents for Standard IV*

Main competences	Specific competences	Learning activities	Suggested teaching and learning methods	Assessment criteria	Suggested resources	Number of periods
1.0 Demonstrate mastery of scientific theories	1.1 Demonstrate an elementary understanding of scientific theories	(a) Explain the basic principles of health (<i>balanced diet, physical exercises, personal and environmental hygiene, safety signs and symbols</i>)	<p>Brainstorming: Guide the pupils through brainstorming ideas on balanced diet, physical exercises, personal and environmental hygiene, safety, sign and symbols</p> <p>Group discussion: Guide pupils through discussion to explain the concept of the basic principles of health</p> <p>Guest speaker: Organise pupils for a session and invite a health expert to explain the basic principles of health</p>	The basic principles of health are clearly explained	Tools for personal and environmental hygiene, charts and diagrams, showing safety, signs and symbols, videos and animations illustrating balanced diet, physical exercises, personal hygiene and environmental cleanliness	30

Main competences	Specific competences	Learning activities	Suggested teaching and learning methods	Assessment criteria	Suggested resources	Number of periods
			<p>Questions and answers: Guide the pupils through asking questions to explain the basic principles of health</p> <p>Case study/scenarios: Guide the pupils through case studies/scenarios to explain the importance of personal and environmental hygiene</p>			
		(b) Describe types of common human diseases (<i>Modes of transimission, causes, control and preventions</i>)	<p>Group discussion: Guide the pupils through discussion to describe common types of human diseases</p> <p>Guest speaker: Organise the pupils for a session and invite a health expert to describe</p>	Types of human diseases are correctly described	Videos, pictures, animations which demonstrate balance diet, physical exercises, personal and environmental hygiene, brochures or pamphlets of various common human diseases	

Main competences	Specific competences	Learning activities	Suggested teaching and learning methods	Assessment criteria	Suggested resources	Number of periods
			<p>the common types of human diseases</p> <p>Case study/scenario: Guide the pupils through case studies/ scenarios to identify ways of controlling and preventing types of common human diseases</p>			
		(c) Explain the concept of matter (<i>types and characteristics</i>)	<p>Questions and answers: Guide the pupils through questions and answers to explain the concept of matter</p> <p>Group discussion: Guide the pupils through discussion to identify types and characteristics of matter</p>	The concept of matter is clearly explained	Various things in form of solids, liquid and gas, pictures and animations illustrating types of matter	

Main competences	Specific competences	Learning activities	Suggested teaching and learning methods	Assessment criteria	Suggested resources	Number of periods
		(d) Explain the concept of combustion (<i>meaning, causes and effects</i>)	<p>Questions and answers: Guide the pupils through Questions and answers to explain the concept of combustion</p> <p>Inquire based learning: Guide the pupils through exploring to explore combustible materials in their environment</p> <p>Group discussion: Guide pupils through discussion to identify materials necessary for combustion</p>	The concept of combustion is clearly explained	Matches or lighter, combustible materials, such as papers and woods, animations that shows the burning of different combustible materials	

Main competences	Specific competences	Learning activities	Suggested teaching and learning methods	Assessment criteria	Suggested resources	Number of periods
			<p>Practical:</p> <p>Guide the pupils to burn various combustible materials and explain the concept of combustion</p>			
	1.2 Make simple scientific observations	(a) Investigate the life cycle of insect vectors (<i>housefly, cockroach and mosquito</i>)	<p>Investigation:</p> <p>Guide the pupils through investigating the life cycles of insect vectors found in the environment</p> <p>Field trip:</p> <p>Arrange a study trip to a nearby site for the pupils to explore and identify life cycles of insect vectors found in the environment</p>	Life cycles of insect vectors are clearly investigated	Science kit, insects such as houseflies, cockroaches, mosquitos and charts, videos/ animations showing stages of growth and developments	30

Main competences	Specific competences	Learning activities	Suggested teaching and learning methods	Assessment criteria	Suggested resources	Number of periods
			<p>Group discussion: Guide the pupils through discussion to identify life cycles of insect vectors found in the environment identified during the field trip</p>			
	1.3 Demonstrate a basic understanding of types of energy and their uses	(a) Describe types of energy (<i>heat, light and sound energy</i>) and their uses	<p>Brainstorming: Guide pupils through brainstorming to explain the concept of energy</p> <p>Inquiry based learning: Guide the pupils through exploring heat, light and sound energy and then ask them questions to explain the concept of energy</p>	Types of energy and their uses are clearly described	Thermometer, heater, batteries, electric wires, bulb, guitar, bell, radio, microphones, , solar cells, speakers, videos and animations on heat, light and sound energy	30

Main competences	Specific competences	Learning activities	Suggested teaching and learning methods	Assessment criteria	Suggested resources	Number of periods
			<p>Group discussion: Guide the pupils through discussion to describe sources, characteristics and uses of heat, light and sound energy</p> <p>Demonstration: Guide the pupils through demonstration to explain different uses of heat, light and sound energy</p>			
2.0 Demonstrate mastery of elementary scientific skills	2.1 Conduct elementary scientific experiments	(a) Conduct simple experiments to investigate the states of matter	<p>Case study: Guide the pupils through a case study to identify the states of matter</p>	Simple experiments on characteristics of matter are conducted correctly	Source of heat, materials in liquid, solid and gaseous forms	30

Main competences	Specific competences	Learning activities	Suggested teaching and learning methods	Assessment criteria	Suggested resources	Number of periods
			<p>Hands-on activities: Guide the pupils through performing various activities to explain the characteristics of matter</p>			
		(b) Conduct simple experiments to demonstrate importance of air in combustion	<p>Group discussion: Guide the pupils through discussing the importance of air in combustion</p> <p>Hands-on activities: Guide the pupils through performing various activities to demonstrate importance of air in combustion</p>	Simple experiments on importance of air in combustion are correctly conducted	Science kit, sources of heat, combustible materials and tin	
		(c) Conduct simple experiments on heat, light and sound energy	<p>Group discussion: Guide the pupils through discussing procedures for conducting experiments on energy</p>	Simple experiments on heat, light and sound energy are correctly conducted	Sources of heat, light and sound, and science kit	

Main competences	Specific competences	Learning activities	Suggested teaching and learning methods	Assessment criteria	Suggested resources	Number of periods
			<p>Experimentation: Guide the pupils through carrying out experiments on heat, light and sound energy</p>			
3.0 Demonstrate mastery of elementary ICT skills	3.1 Use ICT for learning	(a) Use ICT to draw and arrange various shapes in a logical sequence	<p>Group discussion: Guide the pupils through discussing procedures for using ICT to draw and arrange various shapes in a logical sequence</p> <p>Demonstration: Guide the pupils through interactive demonstration to draw and arrange various shapes in a logical sequence by using ICT</p>	ICT is used properly to draw and arrange various shapes in a logical sequence	Mobile phone, computer tablet, simple programme software for drawing and arranging various shapes	25

Main competences	Specific competences	Learning activities	Suggested teaching and learning methods	Assessment criteria	Suggested resources	Number of periods
4.0 Design simple computer programme	4.1 Design simple computer programme	(a) Develop simple games that use a single shape by using block-based programming language	<p>Project work: Guide the pupils through creating simple games that use single shape by using block-based programming language</p> <p>Demonstration: Guide the pupils through interactive demonstrations to identify how to design simple games by using block-based programming languages</p>	Simple games that use a single shape are correctly developed by using block-based programming languages	Computer programmes, computer and projector	30

Standard V

Table 4: Detailed Contents for Standard V

Main competences	Specific competences	Learning activities	Suggested teaching and learning methods	Assessment criteria	Suggested resources	Number of periods
1.0 Demonstrate mastery of scientific theories	1.1 Demonstrate an elementary understanding of scientific theories	(a) Explain the human digestive system (<i>meaning, parts and their functions</i>)	<p>Brainstorming: Guide the pupils through brainstorming on the meaning of digestive system</p> <p>Discussion: Guide the pupils through discussing parts of the human digestive system and its functions</p> <p>ICT based learning: Guide the pupils through explaining the human digestive system using simulations</p>	Human digestive system is correctly explained	Models, charts, diagram and animations that shows human digestive system	45

Main competences	Specific competences	Learning activities	Suggested teaching and learning methods	Assessment criteria	Suggested resources	Number of periods
		(b) Explain the human reproductive systems	<p>Discussion: Guide the pupils through manageable groups to discuss human reproductive systems</p> <p>ICT based learning: Guide the pupils through simulation to explain male and female reproductive systems</p>	Female and male reproductive systems are correctly explained	Models, pictures, diagrams, video and animations showing human reproductive system	
		(c) Explain the growth in animals and plants	<p>Brainstorming: Guide the pupils through brainstorming idea on the concept of growth</p> <p>Discussion: Guide the pupils through manageable</p>	Growth in animals and plants is clearly explained	Science kit, models, animations, videos, and pictures that shows growth in animals and plants	

Main competences	Specific competences	Learning activities	Suggested teaching and learning methods	Assessment criteria	Suggested resources	Number of periods
			groups to discuss and explain the concept of growth in animals and plants			
		(d) Explain the stages of development of the human body	<p>Discussion: Guide the pupils through manageable groups to explain stages of development of human body</p> <p>Questions and answers: Guide the pupils through questions and answers to explain stages of development of human body</p>	Stages of development of human body are correctly explained	Animations, videos, pictures, charts and posters about stages of development of human body	

Main competences	Specific competences	Learning activities	Suggested teaching and learning methods	Assessment criteria	Suggested resources	Number of periods
	1.2 Demonstrate a basic understanding of types of energy and their uses	(a) Explain the concept of magnetism (<i>meaning, properties and applications</i>)	<p>Questions and answers: Through questions and answers guide the pupils to explain meaning, properties and uses of magnets</p> <p>ICT based learning: Guide the pupils through videos to explain the properties of magnet</p> <p>Discussion: In manageable groups, guide the pupils through discussing different uses of magnets</p>	Concept of magnetism is correctly explained	Magnet, science kit, ferromagnetic materials including metals such as iron, animations and videos showing different properties and uses of magnet	45

Main competences	Specific competences	Learning activities	Suggested teaching and learning methods	Assessment criteria	Suggested resources	Number of periods
			<p>Gallery walk: Guide the pupils through gallery walk to learn different uses of magnets</p>			
2.0 Demonstrate mastery of elementary scientific skills	2.1 Conduct elementary scientific experiments	(a) Conduct simple scientific experiments on growth in animals and plants	<p>Questions and answers: Guide the pupils through questions and answers to describe the procedures of conducting simple scientific experiments</p> <p>Experimentation: Guide pupils through conducting experiments on animals and plants growth</p>	Simple scientific experiments on growth in animals and plants are correctly conducted	Science kit, animals, insects, plant seed, tape measure or ruler, animations, videos, pictures showing stages of animals and plants growth	45

Main competences	Specific competences	Learning activities	Suggested teaching and learning methods	Assessment criteria	Suggested resources	Number of periods
		(b) Conduct simple experiments to demonstrate magnetic properties	Experimentation: In manageable groups, guide pupils to perform experiments to determine magnetic properties	Simple experiments to demonstrate magnetic properties are correctly conducted	Science kit, magnets, ferromagnetic materials including metals such as iron videos and animations showing magnetic properties	
3.0 Design simple computer programme	3.1 Design simple computer programme	(a) Develop simple games that use two shapes by using block-based programming language	Discussion: Guide the pupils through discussing the way of developing simple games of two shapes Demonstration: Demonstrate to the pupils how to use block-based programming language to develop simple games of two shapes	Block-based programming language is used correctly to develop simple games of two shapes	Computer, computer program and projector	40

Main competences	Specific competences	Learning activities	Suggested teaching and learning methods	Assessment criteria	Suggested resources	Number of periods
			<p>Hands on activities: Guide the pupils through hands on activities to develop simple games of two shapes using block-based programming language</p>			

Standard VI

Table 5: Detailed Contents for Standard VI

Main competences	Specific competences	Learning activities	Suggested teaching and learning methods	Assessment criteria	Suggested resources	Number of periods
1.0 Demonstrate mastery of scientific theories	1.1 Demonstrate elementary understanding of scientific theories	(a) Explain respiratory systems in animals and plants (<i>meaning, parts and mechanisms</i>)	<p>Brainstorming: Guide the pupils through brainstorming the meaning of respiratory system</p> <p>Group discussion: Guide the pupils through discussing the parts and mechanisms of respiratory systems of human and plants</p> <p>ICT-based learning: Guide the pupils through explaining the mechanisms of respiration systems of human and plants using simulation</p>	Respiratory systems in animals and plants are clearly explained	Pictures, diagrams and models of respiratory systems of human and plants, videos/animations showing mechanisms of respirations in human and plants	45

Main competences	Specific competences	Learning activities	Suggested teaching and learning methods	Assessment criteria	Suggested resources	Number of periods
		(b) Explain the concept of acids and bases (<i>meaning, properties, source and uses</i>)	<p>Group discussion: Guide the pupils through discussing the meaning, properties, sources and uses of acids and bases</p> <p>Practicals: Guide the pupils through practicals to explain the properties of acids and bases</p>	The concepts of acids and bases are clearly explained	Real objects containing acids and bases, and litmus papers	
		(c) Explain the concept of a machine (<i>meaning, type and uses</i>)	<p>Questions and answers: Guide pupils through questions and answers to explain the meaning of a machine</p> <p>Group discussion: Guide the pupils through discussing the types and uses of a machine</p>	The concept of a machine is clearly explained	Simple and complex machines, videos and animations showing uses of machines	

Main competences	Specific competences	Learning activities	Suggested teaching and learning methods	Assessment criteria	Suggested resources	Number of periods
			<p>Field trip: Guide the pupils to visit places that use machines to produce products so that they can explain the concept of a machines</p> <p>Hand on activities: Guide the pupils through using simple machines so that they can explain the uses of a machines</p>			
		(d) Explain the concepts of floating and sinking	<p>Group discussion: Guide the pupils through discussing the concept of floating and sinking of the objects</p> <p>Questions and answers: Guide the pupils through questions and answers to identify the characteristics of objects that can float and sink</p>	The concepts of floating and sinking of objects are explained clearly	Real objects, such as water, piece of wood and coins	

Main competences	Specific competences	Learning activities	Suggested teaching and learning methods	Assessment criteria	Suggested resources	Number of periods
	1.2 Demostrate a basic understanding of types of energy and their uses	(a) Explain the concept of electricity (<i>meaning, sources and uses</i>)	<p>Group discussion: Guide the pupils through discussing the meaning, sources and uses of electricity</p> <p>Gallery walk: Guide the pupils through identifying sources of electricity using gallery walk</p> <p>Brainstorming: Guide the pupils through brainstorming on the applications of electricity and its safety rules</p> <p>Questions and answers: Guide the pupils through</p>	The concept of electricity is clearly explained	Electric cables, switch, bulb, ammeter, voltmeter and batteries	45

Main competences	Specific competences	Learning activities	Suggested teaching and learning methods	Assessment criteria	Suggested resources	Number of periods
			questions and answers to explain the applications of electricity and its safety rules			
		(b) Describe simple electric circuit (<i>parts, type, symbols and constructions</i>)	<p>Questions and answers: Guide pupils through questions and answers to explain the meaning of simple electric circuit</p> <p>Group discussion: Guide the pupils through discussing parts, type, symbols and constructions of simple electric circuit</p> <p>Demonstration: Guide the pupils through demonstration to explain parts and construction of simple electric circuit</p>	The concept of of simple electric circuit is explained clearly	Electric cables, bulb, switch, ammeter, voltmeter and batteries	

Main competences	Specific competences	Learning activities	Suggested teaching and learning methods	Assessment criteria	Suggested resources	Number of periods
2.0 Demonstrate mastery of elementary scientific skills	2.1 Conduct elementary scientific experiments		<p>Brainstorming: Guide the pupils through brainstorming on different sources of acids and bases in the environment</p> <p>Practicals: Guide the pupils through identifying the presence of acids and bases in different substances in the environment</p>	Experiments to identifying acids and bases substances in the environment are correctly conducted	Real objects that contain acids and bases, and litmus papers	45
		(b) Conduct simple experiments about machines	<p>Practicals: Guide the pupils through conducting different simple experiments using machines</p> <p>Project work: Guide the pupils through constructing simple machines</p>	Simple experiments about machines are correctly performed	Real objects, simple and complex machines	

Main competences	Specific competences	Learning activities	Suggested teaching and learning methods	Assessment criteria	Suggested resources	Number of periods
		(c) Conduct simple experiments on floating or sinking	<p>Practicals: Guide the pupils through conducting experiments to identify objects that float or sink</p> <p>Field trip: Guide the pupils to visit a shore of a lake or sea and observe how water transport vehicles float</p> <p>Hands on activities: Guide pupils to construct models of objects that floats or sinks</p>	Experiments to identifying objects that float or sink are correctly conducted	Real objects, such as water, a piece of wood, coins, baloon filled with air and pictures of objects that float or sink	
		(d) Conduct experiments on simple electric circuits	<p>Project work: Guide the pupils to conduct experiments on simple electric circuits</p>	Experiments on construction of simple electric circuits are correctly conducted	Batteries, electric cables, bulb and switch	

Main competences	Specific competences	Learning activities	Suggested teaching and learning methods	Assessment criteria	Suggested resources	Number of periods
			<p>Hands on activities: Guide pupils to conduct experiment to identify structures of simple electric circuit</p>			
3.0 Design simple computer programme	3.1 Design simple computer programme	(a) Develop simple games that use more than two shapes using a block-based programming languages	<p>Group discussion: Guide the pupils through discussing the uses of block-based programming languages in playing simple games that develop ability to explain scientific phenomena and concepts</p> <p>Demonstration: Guide the pupils through demonstration to develop simple games that connect more than two shapes</p>	Appropriate block-based programming languages is used correctly to create simple games that connect more than two shapes	Computer, projector and computer programmes	40

Main competences	Specific competences	Learning activities	Suggested teaching and learning methods	Assessment criteria	Suggested resources	Number of periods
			<p>Practicals: Guide the pupils through using block-based programming languages to develop simple games that connect more than two shapes</p>			

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