Background

This is Primary Seven Integrated Science Syllabus. From Primary One to Primary Three, learning is based on themes, learning outcomes and competences. Most of the science-related competences at that level are covered under the literacy strands of the Thematic Curriculum. From Primary Four to Seven, learning is based on subjects.

This Integrated Science Syllabus outlines the expected learning outcomes, content and language competences which are presented in a matrix.

Learners in P7 are expected to have developed basic literacy skills in English language. You as the science teacher, is required to carry out assessment from time to time to check if learners understand the concepts correctly and are able to consolidate what was acquired in earlier classes. As the Science teacher, you need to know that some of the learners in your class are exceptional and it is your duty to arrange activities basing on each learner's needs. Accommodating all learners' individual needs can be addressed if the necessary adaptations are made in the areas of methodology, content, environment, instructional materials and learning activities.

The instructional process will follow what was in the old syllabus and you will be required to use the old instructional materials such as textbooks and charts whenever possible.

Rationale

This revised P7 Integrated Science Syllabus has been designed to consolidate the basic literacy and numeracy skills acquired during the Thematic Curriculum, the transition year and P5 and P6.

It is also intended to provide learners with knowledge, skills, the desired attitudes and values on basic science, health education, agriculture and the environment that are important to prepare learners for final assessment of the primary cycle.

There are eight topics which have been derived from four of the eight themes in this cycle. Themes like Human Health, The World of Living Things, Managing Changes in the Environment, Science in Human Activities and Occupations are not in this class because they have been

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taught in lower classes. The eight topics are divided into three terms. Three topics in Term I, three topics in Term II and two topics in Term III.

In revising the P7 Syllabus, the following changes were made on the old Syllabus

- Topic overflow:
  - Muscular (Skeletal System) has been brought from P4 Term II to P7 Term I.
- Overlaps
  - Interdependence of Things in the Environment from P4 Term I has been merged with Agro Forestry from P7 Term II and put in P7 Term III.
  - The Community, Health and Social Problems among Young People from P5 Term II; Primary Health Care from P5 Term III; and Family Health from P5 Term III have been merged with Population and Health from P7 Term I and put to P7 Term III.
- Other changes
  - By merging related topics and taking out unnecessary repetitions, content has been reduced in order to keep learning experiences light and simple.
  - The scope and sequencing of content has been based on progression of outcomes and competences.
  - Literacy skills and language competences have been included in each topic to help clarify concepts.
  - Possible life skills which can be developed have been suggested in each topic.
  - Subject and language competences have been included to replace objectives. These are arranged in order of cognitive levels namely knowledge, comprehension and application.
  - General outcomes instead of aims and objectives have been provided for each topic.
  - The background for each topic has been given together with other necessary guidance to the teacher.
  - Key words for each topic have been included in order to enrich the learner's vocabulary and mastery of concepts.

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Methodology

During the teaching/learning process, you are expected to enhance learning through the most effective learner-centred methods and activities. You will be expected to facilitate learning as the learners do the activities. Therefore you are expected to make thorough arrangements for necessary instructional materials, learning activities and how they will be carried out. The methods you choose to use should promote learner-centred learning activities.

Ensure that the necessary learning materials are collected and availed to learners in time for them to be used during the learning activities. Give adequate guidance and allow learners to carry out the activities you have prepared.

Guide and supervise all the learning activities. The active verbs used in expressing the learning competences are all directed to the learner. As a result of the teaching/learning processes, the learner should be able to exhibit these competences.

Task analysis is another important approach. It involves breaking down the available content or activity to be taught into simpler manageable steps that can be accommodated easily at the pace of every individual learner.

You should use the environment as much as possible to help the learners relate science to real life situations and experiences. You are required to let the learners carry out experiments, exhibitions, projects, field trips and excursions. Encourage the learners to record and report on their findings. Use methods that will provide the learner with the opportunity to explore and acquire more knowledge, concepts, skills, abilities, right attitudes, values and competences. Provide opportunities for learners to share what has been learnt.

Instructional Materials

You are expected to use a variety of books and charts available to help you prepare the correct content on the topics. The specification of the suitable learners' textbooks, teachers' guides, readers and charts on Science topics have been provided in a separate *(Implementation Guidelines)*. Refer to it

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for more guidance. The existing materials based on the old curriculum, are still useful and cover the required Science content. However, new textbooks which cover language competences should be used as well. Your classroom should possess different attractive incidental reading materials in form of pictures, word cards, educational charts, models and equipment improvised from locally available materials. These should be of low or no cost and learner friendly. They should be able to boost the teaching/learning process.

Assessment Guidelines

Continuous Assessment is recommended and should be based on the summarised competences found at the end of each topic in the syllabus. Assessment should be included as part of each lesson activity and should be part of every lesson plan. When you teach, you are teaching a class of individual learners. In order to help them learn, you need to know their weaknesses and strengths on a continuous basis. This will help you to structure any follow-up strategies.

One of the principles of the Revised Primary Curriculum is its emphasis on developing competences. The P7 Curriculum covers both subject and language competences. The Curriculum aims at learners mastering various skills with understanding rather than memorising content. While all curricula include specific skills, the revised Primary Curriculum is built on measurable competences, for example, the learner:

1. names different bones and muscles of the human arm.
2. describes different joints found in the human body.

Like in P4, P5 and P6, assessment guidelines are provided to assist the teacher carry out, manage and keep records on each individual learner on class progress and on end of term performance. You are therefore encouraged to record the innovative products of the learner that may not have been planned but indicate how the learner is progressing.

Besides continuous assessment, there shall be end of term and end of year assessment carried out. However, you will be required to distribute your continuous assessment activities each term as follows:

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Assessment Areas	Suggested No. of Assessment Activities and Weighting	
	No. of Activities	Weighted
Class Exercise	10	12%
Class Tests	4	8%
Projects	1	8%
Experiments	2	6%
Oral (tests) Exercise	4	6%
	Subtotal	40%
End of Term	1	60%
	Grand Total	100%

End of primary cycle written examinations (Primary Leaving Examinations) will be based on this syllabus and Integrated Science content covered right from Thematic Curriculum through to P7. End of cycle paper at P7 will be called Primary Integrated Science. It will consist of section A of 40 short answer questions and section B of 15 structured questions. Section A will carry 40% marks while section B 60%. Primary Integrated Science will be marked out of 100%.

General Learning Outcomes

When the learners go through this syllabus, they will be able to:

- survey, identify and distinguish the attributes of plants, animals, other objects and conditions in the environment.
- use characteristics to compare and classify animals, plants and other objects in the environment.
- identify the features and describe the functions of different parts of the human body.
- take care of the different parts of their bodies and practice good health habits.
- keep safe and avoid accidents.
- understand the conditions for proper growth of living things.
- apply correct scientific processes in investigations of various phenomena.

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- show knowledge of and take care of the environment for its sustainable use.

Competences

The learner is able to:

- survey, identify and distinguish the attributes of plants, animals, other objects and conditions in the environment by making trips and excursions to observe, collect, group things, make records, interpret results and make reports.
- use characteristics to compare and classify animals, plants and other objects in the environment by making trips and excursions to:
  - collect specimens of plants and animals
  - observe plants and animals grow
  - group/classify plants and animals (kingdoms)
  - compare plants and animals
  - record
  - report
  - care for plants and animals
- identify the characteristics and functions of different parts of the human body by:
  - identifying and naming the different parts of the human body
  - describing functions of each part
  - relating the different parts of the body to human activities
- take care of the different parts of the human body and practice good health habits by:
  - identifying the different parts of the body
  - naming different activities done in order to keep the body clean
  - caring for different parts of the body
  - keeping healthy and practicing good health habits
  - having self-concept, confidence and self-esteem

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- keep safe and avoid diseases and accidents by:
  - identifying ways of keeping safe from diseases and accidents at home and in the community
  - identifying common accidents and first aid given for each
  - identifying dangers in the environment and taking precautions
  - initiating activities which promote safety
  - participating in safety-related activities
- understand the conditions for proper growth of living things by:
  - identifying the different conditions for proper growth
  - experimenting the different conditions for proper growth
  - recording the finding
  - reporting the results of experiments accurately
- apply correct scientific processes in investigations of various phenomena by:
  - identifying problems
  - designing and practicing scientific investigation processes
  - examining the evidence useful in inferences
  - demonstrating the skills of observation, classification, accurate measurement and recording
  - making predictions and formulating hypotheses for evidence
  - communicating findings accurately and honestly
  - analysing causes and effects
  - using a variety of sources for acquiring information
  - recording information with reasonable accuracy
  - appreciating basic concepts about matter and energy

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Topic Outline

Term I

Theme	Topic	Sub-Topics	No of Periods
HUMAN BODY	1. Muscular – Skeletal System	• The structure of the human skeleton • Names of different bones • Joints • Voluntary and involuntary muscles • Functions of the system • Diseases and disorders of bones, muscles and the system • Health habits that help to keep the system in a healthy working condition • Prevention of muscular and skeletal diseases • Importance of correct posture	24

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Theme	Topic	Sub-Topics	No of Periods
MATTER AND ENERGY	2. Electricity and Magnetism	• Electricity: – Sources of electricity – Types of electricity – Conductors and insulators – Electric circuits – Short circuits – Safety precautions in handling electricity and electrical appliances – Importance of electricity in solving everyday life problems • Magnetism: – Natural and artificial magnets – Making temporary magnets – Generating electricity using a dynamo – Permanent magnets – Uses of magnets and the electric bell • Electricity and magnetism in the modern world of work	24

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Theme	Topic	Sub-Topics	No of Periods
THE ENVIRONMENT	3. Energy Resources in the Environment	• Energy resources and their sources: – Energy resources from water (hydro, steam engines and tidal energy) – Energy resources from fossil fuels – Energy resources from plants (bio fuel and bio gas) – Energy resources from animals (animal energy and biogas) – Energy resources from wind – Importance of other different energy resources	12

Term II

Theme	Topic	Sub-Topics	No. of Periods
MATTER AND ENERGY	4. Simple Machines and Friction	• Simple machines and their application in daily life: – Mechanical advantage of machines – Principle of moments – Levers – Inclined planes (ramps and slopes) – Wedges – Screws – Pulleys – Wheels and axles • Friction: – Examples of friction in nature – Useful friction and how to increase it – Friction as a nuisance force and how to reduce it	24

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Theme	Topic	Sub-Topics	No. of Periods
HUMAN BODY	5. Excretory System	• The excretory organs • The human skin: – Structure, function and care of the human skin – Diseases and disorders of the human skin • The urinary system (kidneys, ureter and urinary bladder) • Kidneys: – Structure, function and care of the kidney – Diseases and disorders of the kidney • The lungs as excretory organs: – Diseases and disorders of lungs • Good habits for proper functioning of the system	18

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Theme	Topic	Sub-Topics	No. of Periods
MATTER AND ENERGY	6. Light Energy	• Light as a form of energy: – Natural and artificial sources of light – How light travels – Beams of light – Importance of light in the environment • Effects of different materials on light • Shadows (eclipses, pin-hole camera) • Reflections, plane mirrors, periscope: – Characteristics of images formed by plane mirrors • Refraction, what it is and its effects (Dispersion and Rainbow) • Lenses: – The magnifying glass • Lens camera: – Characteristics of images formed by lens camera • The human eye: – Structure (functions) of the human eye – Characteristics of images formed by the eye – Comparison of the eye and lens camera – Common eye defects and their corrections • Diseases and disorders of the human eye: – Care for the human eye	18

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Term III

Theme	Topic	Sub-Topics	No. of Periods
THE ENVIRONMENT	7. Interdependence of Things in the Environment	• Components of the environment • Interdependence of plants and animals: – Animals depend on plants – Animals depend on other animals – Plants depend on animals – Plants depend on other plants • Interdependence of living and non-living things: – Animals depend on non-living things (air, water, soil) – Plants depend on non-living things – Non-living things benefit from living things • Agro forestry and its importance in the environment: – Growing crops and trees together – Rearing animals and growing trees on the same farm – Growing crops, rearing animals and growing trees on the same farm – Care for trees in agro forestry – Proper harvesting of trees in agro forestry (pollarding, coppicing, lopping) • Managing a school/home wood project	24

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Theme	Topic	Sub-Topics	No. of Periods
THE COMMUNITY, POPULATION AND FAMILY LIFE	8. Population and Health	• Community health and social problems: – Types of common sicknesses in a home and their causes – Community health and social problems among young people – Anti-social behaviour – Sex deviations (bestiality, incest, homosexuality, lesbianism, oral sex, masturbation) – Controlling common sicknesses in a home • Activities to address health concerns (health survey and education) • Collecting information and data on human population (demography): – Avoiding health and social problems – A simple health survey, health data and information on homes and the community • Activities of health clubs	24

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Theme: Human Body

Topic 1: Muscular – Skeletal System

24 Periods

Background

Learners already have some basic knowledge about major organs and other systems of the body. This topic describes different bones and muscles and how they work to aid movement. The skeleton provides a structure upon which flesh is attached and gives shape to the body. This topic is an overflow from P4 Term II. It is developed from learners' knowledge of the parts of the body.

Learning Outcomes

The learner:

- develops appreciation for the human body as a system of muscles and bones.
- develops knowledge and skills for maintaining the body as a system.

Life Skills

- Problem-solving
- Creative thinking
- Empathy
- Critical thinking
- Self-awareness

Values

- Taking decisions
- Making right choices
- Appreciation
- Concern
- Care
- Acceptance

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Subject Competences	Language Competences	Content	Suggested Activities
The learner: • identifies different bones and muscles of the human body. • identifies different joints found in the human body. • discusses functions of the muscular skeletal system. • states diseases and disorders of bones, muscles and the system. • explains ways of preventing skeletal and muscular diseases. • demonstrates correct body postures . • describes good health habits for the system. • draws and labels the skeleton and voluntary muscles.	The learner: • names the different bones and muscles of the human body. • reads words, sentences and stories about muscles and joints of the body. • recites a poem on diseases and disorders of muscles and bones. • writes guided notes on the system. • draws and labels the structure of the skeletal system and voluntary muscles.	Muscular – skeletal system: • Structure of human skeleton • Names of different bones • Joints: – Movable joints (hinge, ball and socket, pivot and gliding joints) – Immovable joints (skull) • Muscles: – Voluntary muscles – Involuntary muscles • Functions of the system • Diseases and disorders of bones, muscles and the skeletal system • Prevention of the diseases and disorders of bones, muscles and the system • Importance of correct posture • Health habits that help to keep the system in a healthy working condition	• Making observations on real or models of human bones • Naming different bones and muscles of the human body • Matching different bones with body parts and movable joints of the human body • Drawing and labelling the structure of a human skeleton • Modelling the human skeleton • Reading stories about muscles and joints of the body • Describing bone-related diseases and disorders

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Guidance to the Teacher

- Emphasise activities and practices that can keep the body systems in a healthy working condition.
- Guide learners to relate the names of body structures to the parts of their own body which they learnt in P2 and P4 classes.
- Guide learners to discuss the uses of the different parts of the body.
- Let learners name the bones which help the different parts of their body to move.

Suggested Competences for Assessment

The learner:

- names different bones and muscles of the human body.
- explains functions of the muscular skeletal system.
- models the human skeleton.
- uses observation to describe different bones of the human body.

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Theme: Matter and Energy

Topic 2: Electricity and Magnetism

24 Periods

Background

Electricity and magnetism are essential aspects of science and technology. There are many electric equipments around us which should be used to provide interactions with common materials. Electricity is a key source of energy for industries, home and the modern world of work. This topic has been retained in P7 Term I. This topic is only tackled in this class. It requires a diligent approach.

Learning Outcomes

The learner:

- appreciates the importance of electricity and magnetism in the modern world of work.
- develops the necessary scientific knowledge, principles and skills to solve problems related to electricity and magnetism.

Life Skills

- Problem-solving
- Critical thinking
- Creative thinking
- Decision-making
- Effective communication

Values

- Logic
- Taking decisions
- Making right choices
- Confidence
- Responsibility

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Subject Competences	Language Competences	Content	Suggested Activities
The learner: • identifies sources and types of electricity. • experiments with static electricity. • draws and labels the parts of electric circuit. • discusses the importance of electricity in solving day-to-day problems. • discusses the dangers and safety precautions in handling electricity and electrical appliances.	The learner: • names different parts of an electric circuit • reads words and sentences on electricity and magnetism. • writes words, sentences and short stories about electricity and magnetism in the modern world of work.	Electricity: • What it is – Electricity as a form of energy – Types of electricity (current, static) • Sources of electricity – The dry cell • Conductors and insulators • Electric circuits (fuse, switch, bulb) • Short circuits, causes and how to avoid them • Importance of electricity in solving everyday problems • Safety precautions in handling electricity and electrical appliances	• Assembling an electric circuit and electric bell • Naming the parts of an electric circuit • Generating static electricity • Making temporary magnets • Drawing and labelling electric circuits and ways of making temporary magnet

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Subject Competences	Language Competences	Content	Suggested Activities
• identifies natural and artificial magnets. • demonstrates ways of making temporary magnets. • discusses electricity and magnetism in the modern world of work. • discusses the process involved in generation of electricity using a dynamo.	• draws and labels the electric bell and ways of making temporary magnets.	Magnetism • Magnets: – Magnetic materials – Properties of magnets • Types of magnets: – Natural magnets (Lodestone and Magnetite) – Permanent magnets • Making temporary magnets • Electro magnets: – Electric bell • Electricity and magnetism in the modern world of work • Generating electricity using a dynamo	• Drawing and locating an electric bell • Generating electricity using a dynamo • Reading and writing words, sentences and short stories about electricity and magnetism in the modern world of work

Guidance to the Teacher

- Emphasise the importance of a magnet in the modern world of work with heavy use of electronics.
- Prepare learners and guide them to handle electricity and electric appliances safely.
- Use the commonly available materials to help your learners do experiments on static electricity, electric circuits and to examine parts of an electric bulb, bell and switch.
- Demonstrate to your learners how electricity can be used to make magnets and how magnets can be used to produce electricity.

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- Lead learners to design and construct simple electrical devices such as electric bells and a model of a traffic light system.
- Help learners to appreciate the role of electricity as a form of energy.

Suggested Competences for Assessment

The learner:

- names the parts of an electric circuit.
- connects a simple electric circuit.
- takes safety precautions on dangers of electricity.
- makes magnets using different methods.
- explains the importance of electricity in solving everyday problems.
- draws and labels ways of making temporary magnets.

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Theme: The Environment

Topic 3: Energy Resources in the Environment — 12 Periods

Background

There are many energy resources in the environment. Your learners have had experiences and lessons on various aspects of the environment. Links within the different aspects should be used to develop knowledge of energy resources and how people can utilise them. In this topic, you need to guide the learners to identify energy resources and their sources. This topic should be approached practically and this involves use of such energy brought out as examples.

Let learners carry out simple practical work like using steam to drive a propeller, producing biogas from animal waste and plant residues and making solar equipment. You can organise trips to different places where energy is being generated and used. Even the school kitchen uses energy for cooking. This topic has been retained in P7 Term I.

Learning Outcomes

The learner:

- develops awareness of different energy resources existing in the environment and their use.
- develops a sense of respect for the environment as a resource base.

Life Skills

- Critical thinking
- Creative thinking
- Decision-making
- Effective communication

Values

- Logic
- Taking right decisions
- Appreciation
- Care
- Confidence
- Making right choices

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Subject Competences	Language Competences	Content	Suggested Activities
The learner: • names different energy resources and their sources. • discusses the importance of different energy resources to people and the environment. • carries out simple experiments using energy from wind or steam. • describes how to make a: – biogas digester – solar equipment • initiates activities which cause safe and sustainable way of using energy.	The learner: • writes short descriptions on energy resources and sources. • reads words and sentences about energy resources and their sources. • writes a story about coal and petroleum. • Draws and labels a biogas digester. • writes steps/ procedures of making a biogas digester • writing steps for setting up solar equipment.	• Energy resources and their sources – The sun as a major source of energy in the environment (solar energy) – Energy resources from water (hydro, steam engines and tidal energy) – Energy resources from fossil fuels (coal and petroleum) – Energy resources from plants (bio fuel, wood fuel, food and biogas from plant residues) – Energy resources from animals: (animal energy and biogas from animal wastes) – Energy resources from wind (wind energy) – Importance of energy resources	• Naming different energy resources and their sources • Experimenting on steam and propeller • Drawing bio gas digester • Writing a story about coal and petroleum • Producing biogas from animal waste and plant residues (project) • Making solar equipment (project)

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Guidance to the Teacher

- Clearly differentiate between resources and sources.
- It is important to lead the learners through simple projects where applicable. The project work may include a resource availability survey and writing on the resources which are found in the school surrounding. It may also include working with Art and Technology to produce articles by utilising resources like solar energy and water.

Suggested Competences for Assessment

The learner:

- names different energy resources and their sources.
- discusses the importance of different energy resources to people and the environment.
- describes the contribution of wind to available energy resources.
- sets up an experiment to demonstrate the use of wind, steam and solar sources of energy.

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Term II

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Topic 4: Simple Machines and Friction

24 Periods

Background

Machines are very important in our day-to-day life. Examples of simple machines include tools we use at home, in carpentry workshops, repair garages and in other activities. Sometimes learners use tools without knowing they are the simple machines referred to in this topic. Guide learners to acquire knowledge on how simple machines operate. Where possible, organise out of class visits for pupils to sites where machines are in use. This topic was formerly in P7 Term III. The existing textbooks will therefore be useful in teaching this topic.

Learning Outcomes

The learner:

- appreciates the importance of machines in everyday life situations.
- develops the capacity to simplify work by using knowledge and principles to make and use simple machines.

Life Skills

- Decision-making
- Critical thinking
- Effective communication
- Problem-solving

Values

- Fluency
- Appreciation
- Responsibility
- Care
- Taking decisions
- Making right choices

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Subject Competences	Language Competences	Content	Suggested Activities
The learner: • states the meaning of friction. • investigates effects of friction on matter. • states the importance of friction. • states the effects of friction on matter. • describes simple machines. • observes how different simple machines work. • describes different classes of levers. • models simple machines using local materials. • carries out experiments with different simple machines. • describes the effect of force on a lever. • demonstrate how an inclined plane works. • carries out practical uses of wedges.	The learner: • listens to stories about the effects of friction on matter. • describes the different ways friction can be increased or reduced. • reads words, sentences and stories about frictional force and how simple machines operate. • writes words, sentences and stories about simple machines. • draws and labels diagrams to show parts of a lever, ramps, wedges, screws, wheels and axles.	Friction: – What it is – Friction as a useful force – How to increase friction – Friction as a nuisance force – How friction can be reduced • Simple machines – What they are – The principle of moments – Mechanical advantage of machines • Levers – What they are – Parts of a lever – Classes of levers • The inclined plane (slope/ ramp) • Wedges (double and inclined planes) • Screws – Nature of screws – Uses of screws	• Carrying out experiments on things that usually wear out due to friction • Setting experiments which illustrate ways of increasing and reducing friction • Experimenting with different simple machines to illustrate how they work • Calculating Mechanical Advantage of machines • Identifying different classes of levers • Calculating simple problems on moment (with one force on either side of the pivot) • Drawing and labelling simple machines

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Subject Competences	Language Competences	Content	Suggested Activities
• calculates mechanical advantage (MA) of machines. • describes what screws are and how they work. • experiments with different types of pulleys. • Compare the relevant human body parts to simple machines		• Pulleys – Single fixed – Single movable – One fixed and one movable pulley working together • Wheels and axles – Examples – How they work • Comparison of human body parts to simple machines	• Writing words, sentences and stories about simple machines • Making and mounting simple pulleys • Modelling simple machines using local materials

Guidance to the Teacher

- Ensure that you have the necessary materials, simple tools and equipment to enable you and your class carry out experiments on simple machines. During the experiments, ensure the safety of for your learners.
- Encourage learners to have hands-on activities in all class experiments involving simple machines.
- Work with your learners on a project which demonstrates the working of a given simple machine.
- Guide learners to investigate the different types of simple machines such as levers, inclined screws, wheels and axles and pulleys.
- Encourage them to make simple machines from local materials.

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Suggested Competences for Assessment

The learner:

- sets experiments, observes and reports on the working of different simple machines.
- carries out experiments to illustrate how friction can be reduced or increased.
- describes the different ways friction can be increased or reduced.
- groups the levers under their different classes.
- draws and labels different simple machines.
- relates the working of human body parts to examples of simple machines.

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Topic 5: Excretory System

18 Periods

Background

Learners already have some basic knowledge about external parts of the human body as well as the major organs and the circulatory systems of the body. The excretory system involves a number of organs like the kidney, skin and lungs which have specialised structures. When the different body systems work, some materials are used up and the body produces waste materials. The waste materials need to be removed from the body. The waste materials need to be removed from the tissues in the body through the excretory system. The removal of wastes from the body is facilitated by our good health habits. This topic has been retained in P7 Term II of the previous syllabus.

Learning Outcomes

The learner:

- appreciates the importance of the excretory system to people.
- acquires the necessary scientific knowledge, principles and skills for maintaining the efficiency of the system.

Life Skills

- Critical thinking
- Problem-solving
- Empathy
- Self-awareness
- Decision-making

Values

- Responsibility
- Taking decisions
- Care
- Sympathy
- Logic
- Concern
- Acceptance

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Subject Competences	Language Competences	Content	Suggested Activities
The learner: • describes excretion. • names different excretory organs in the human body. • describes the functions of the excretory organs in human beings. • names diseases and disorders of the excretory organs in the human body. • practices correct ways of keeping the excretory system healthy. • makes comparisons between the excretory system and other natural environment or man-made systems.	The learner: • names the excretory organs in the human body. • acts a dialogue on how the system works. • reads words, sentences and stories about the excretory system. • draws and labels the excretory organs. • writes brief notes on excretory organs and how the excretory system works.	• Excretion: – What it is • Excretory organs • The human skin – Diseases and disorders of the human skin – Structure, function and care • The urinary system (kidneys, ureter and urinary bladder) – Structures, functions and care – Diseases and disorders of the kidney and the urinary system • The lungs as excretory organs – Structure, function and care – Diseases and disorders of the lungs • Good health habits for proper functioning of the system	• Naming the excretory organs • Describing the functions of each excretory organ • Acting a dialogue on how the system works • Drawing and labelling the excretory organs • Modelling structures of the urinary system • Naming diseases and disorders of the excretory system • Discussing ways of keeping the excretory system healthy

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Guidance to the Teacher

- Guide learners through what they learnt in earlier classes about parts of the body. Guide them to relate this topic to other topics such as respiratory and circulatory systems which they learnt in P6. The diseases related to the organs of the excretory system should be adequately covered.

Resource persons should be invited to talk to learners about how to care for different organs and some of the diseases which affect them.

- Help the learners to appreciate the practices that keep the excretory systems healthy.
- Work with your learners to model some of the excretory organs.
- Help learners to relate the excretory system to diseases particularly the Sexually Transmitted Infections (STIs) and communicable diseases.

Suggested Competences for Assessment

The learner:

- names the different organs of the excretory system.
- describes the functions of the different organs of the excretory system.
- draws and labels the different organs of the excretory system.
- makes models of the kidneys, skin and urinary organs.

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Theme: Matter and Energy

Topic 6: Light Energy — 18 Periods

Background

Learners were introduced to different forms of energy in P5 Term I. They have also learnt about energy resources, the environment, magnetism and simple machines, all of which are related to this topic. Light is a natural energy which comes from the sun. It enables us to see things; enables plants to manufacture food and natural life to continue. When light interacts with other things in nature, some natural phenomena, like a rainbow, are seen. At this stage, you should consider a human eye as an optical organ. This topic was in P7 Term II and it has been retained.

Learning Outcomes

The learner:

- appreciates the importance of light as a form of energy in nature.
- develops the necessary scientific knowledge, principles and skills to solve problems related to light in real-life situations.

Life Skills

- Critical thinking
- Effective communication
- Decision-making
- Problem-solving
- Empathy

Values

- Logic
- Fluency
- Taking decisions
- Making right choices
- Responsibility
- Sympathy

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Subject Competences	Language Competences	Content	Suggested Activities
The learner: • names sources of light. • experiments to investigate how light travels. • uses experiment results to describe the effects of different materials on light. • investigates the behaviour of light when it interacts with different surfaces and objects. • describes how different shadows are formed (eclipses and images). • states the laws of reflection. • calculates simple problems on reflection.	The learner: • names sources of light. • reads words, sentences and stories about light, optical instruments and the eye. • draws and labels optical instruments, the human eye and its defects. • acts a dialogue on the rainbow. • writes a brief description on the interaction between light and different sources.	• Light – What it is • Light as a form of energy: – Natural and artificial sources of light • How light travels: – Rays of beams of light • Importance of light in the environment • Effects of different materials on light: – Transparent – Translucent – Opaque • Shadows: – Eclipses (solar and lunar) – Pin hole camera • Reflection: – What it is – Laws of reflection – Types of reflection – Characteristics of images formed by plane mirrors – Periscope • Pin-hole camera: – Characteristics of images formed with pin-hole camera	• Naming sources of light • Investigating how light travels • Observing images formed by plane mirrors and in pin hole camera • Calculating simple problems on reflection • Making models of pin hole and lens cameras and the eye • Acting a dialogue on the rainbow •

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Subject Competences	Language Competences	Content	Suggested Activities
• describes images formed by plane mirrors. • explains how rainbows are formed. • carries out experiments to investigate the effects of lenses on beams of light. • Names parts of lens camera • describes the working of the human eye as an optical organ. • describes the different human eye defects and their corrections. • practices the correct care of the human eye. • makes models of a pin-hole camera, periscope, lens camera and the eye.		• Refraction – What it is – Principle of refraction – Effects of refraction – Refraction through glass, prism, spectrum – Roygbiv – Dispersion of light • The rainbow – Refraction through a rectangular glass prism • Lenses – Types – Effects of lenses on beams of light – The magnifying glass – The lens camera – Parts of the camera and their functions – Characteristics of images formed by the lens camera • The human eye – Structure – Parts and functions – Characteristics of images formed by the eye – Comparison of the eye and the lens camera – Eye defects and their correction • Diseases and disorders of the human eye: – care for the human eye	• Drawing and labelling optical instruments, the human eye and its defects • Reading words, sentences and stories about light, optical instruments and the eye • Investigating formation of a spectrum • Investigating formation of shadows • Investigating effects of lenses on beams of light • Comparing the human eye and the lens camera • Making a model of a periscope

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Guidance to the Teacher

- Guide learners to understand that light is a very essential natural form of energy. We need it in our day-to-day life.
- This topic has two major parts namely light and organs of the body which respond to it. Guide learners systematically through the different behaviour of light when it interacts with different materials, and different instruments which make use of light energy. Bring out eye structures and how they relate to light energy in the functioning of the eye.
- Make a clear difference between reflection and refraction.
- Emphasise principles related to light when it interacts with different objects and surfaces.
- Make frequent references to life situations on the application of light.
- Work with your learners to construct and produce simple equipment which functions with light energy.
- Build on what they learnt in order to introduce light as a form of energy.
- Bring out the relationships between angles of incidence and reflection.
- Guide learners to understand the principle of reflection and refraction.
- Let the learners construct pinhole cameras, periscopes and model lens cameras.

Suggested Competences for Assessment

The learner:

- carries out experiments involving light.
- names sources of light.
- describes effects of light on different materials.
- draws and labels the structure of the human eye.
- makes models of the eye indicating different structures.
- explains clearly natural phenomena involving light energy.

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Term III

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Theme: The Environment

Topic 7: Interdependence of things in the Environment — 24 Periods

Background

Animals, plants and other things in the environment need each other for survival. Energy which is important in life needs to flow from one thing of nature to another. Some living things feed on others while some offer support to others. Living things benefit from one another. This topic discusses the ways things in the environment benefit from each other. This topic was an overflow from P4 Term I and was merged with Agro-Forestry from P7 Term II.

Learning Outcomes

The learner:

- develops an understanding of the interdependence of things in the environment.
- appreciates the co-existence of things in the environment.

Life Skills

- Critical thinking
- Effective communication
- Self-awareness
- Decision-making
- Problem-solving
- Empathy

Values

- Care
- Concern
- Sharing
- Responsibility
- Fluency
- Appreciation

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Subject Competences	Language Competences	Content	Suggested Activities
The learner: • names the components of the environment. • describes how the components of the environment benefit from each other. • describes ways of caring for animals. • discusses the importance of agro-forestry. • starts and manages a school/home woodlot project.	The learner: • names components of the environment. • reads words, sentences and stories about components of the environment. • acts a dialogue about the components of the environment and on agro-forestry.	• Components of the environment (plants, animals, water bodies, air, soils) • Interdependence of plants and animals – Animals depend on plants – Animals depend on other animals – Plants depend on animals – Plants depend on other plants • Interdependence of living things and non-living things: – Animals depend on non-living things (air, water, soil) – Plants depend on non-living things (air, water, soil) – Non-living things benefit from living things	• Naming components of the environment • Describing how the components of the environment benefit from each other • Discussing the importance of agro-forestry • Describing how to start and manage a school or home woodlot project • Practising different correct ways of harvesting trees in agro-forestry

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Subject Competences	Language Competences	Content	Suggested Activities
• practices correct record keeping. • initiates experiments to illustrate interdependence of the different things in the environment.	• writes words, sentences and stories about components of the environment and agro forestry.	• Agro-forestry: – What agro-forestry is – Growing crops and trees together – Rearing animals and growing crops on the same farm – Rearing and caring for animals, growing crops and trees on the same farm – Importance of agro forestry – Care for trees in agro-forestry – Proper harvesting of trees in agro-forestry (pollarding, coppicing and lopping) • Starting and managing a school/home woodlot project • Record keeping	• Acting a dialogue about the components of the environment and on agro-forestry • Writing words, sentences and stories about components of the environment and agro-forestry • Carrying out experiments on interdependence in the environment

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Guidance to the Teacher

- Encourage learners to explore the environment so as to enrich the content with suitable relevant examples.
- Encourage learners to carry out school/home based projects.
- Initiate and maintain a tree and crop growing project in which learners can participate. Help learners to go through the planning process.
- Guide learners through a variety of games, songs and visits to learning sites to learn about interdependence in nature.
- Guide learners to name different components of the environment and explain how these components depend on each other.
- Help the learner to appreciate the existence of other things so that he/she becomes responsible to protect the environment.
- Give guidelines which will help learners to appreciate the importance of growing trees, crops and rearing animals on the same piece of land.
- Develop skills of protecting and conserving the environment.

Suggest Competences for Assessment

The learner:

- names the components of the environment.
- suggests ways by which animals benefit from plants.
- discusses the importance of agro-forestry.
- writes brief notes on interrelatedness among the components of environment.
- explains the energy flow among living things.

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Theme: The Community, Population and Family Life

Topic 8: Population and Health — 24 Periods

Background

Learners have been introduced to Primary Health Care, its principles, elements and activities in previous classes. They have also learnt about the elements of population and health in Primary Six. This topic is basically on social problems people in a community may face. Although the information in textbooks is useful, lessons must be drawn from examples existing in a given community.

In this topic, involve learners in community health activities which will enable them use the knowledge they have so far gained. This topic has content which was an overflow from P5 Terms II and III and has been merged with the content which was in P7 Term I.

Learning Outcomes

The learner:

- acquires skills and practices to prevent diseases in the community.
- develops knowledge and skills for collecting, recording, organising and interpreting information on population and health.

Life Skills

- Critical thinking
- Problem-solving
- Effective communication
- Decision-making
- Self-awareness
- Creative thinking

Values

- Care
- Concern
- Acceptance
- Responsibility
- Appreciation
- Taking decisions

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Subject Competences	Language Competences	Content	Suggested Activities
The learner: • names types of common sicknesses in a home and community. • describes causes of common sicknesses in a home and community. • states examples of anti-social behaviour and sexual deviations. • discusses dangers of anti-social behaviour and sexual deviations. • describes ways of avoiding sexual deviations. • lists activities to address health concerns. • demonstrates some of the activities to address health concerns. • collects information / data on human population and health in a home and community.	The learner: • names common sicknesses in a home and their causes. • reads words, sentences and stories on how to control sicknesses in a home and community. • recites a poem on ways of avoiding sexual deviations. • role plays doing activities to address health concerns and data collection. • writes information / data on health and social problems in a home and community.	• Community health and social problems: – Types of common sicknesses in a home and their causes – Controlling common sicknesses in a home and community – Community health and social problems among young people: • Anti-social behaviour • Sexual deviations (bestiality, homosexuality, masturbation, oral sex lesbianism, incest) • Ways of avoiding sexual deviations • Activities to address health concerns	• Naming types of common sicknesses in a home and community • Describing causes of common sicknesses in a home and community • Demonstrating activities to address health concerns among young people • Collecting information/ data on human population and health on homes and the community

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Subject Competences	Language Competences	Content	Suggested Activities
• carries out demography (simple surveys) on housing information		– Health surveys – Health education • Collecting information/ data on human population – Demography on; housing information, available health services – Avoiding health and social problems • Activities of health clubs	

Guidance to the Teacher

- Emphasise ways of avoiding sexual deviation and activities that address health concerns.
- Ensure that learners do not get exposed to what is beyond their age.
- You will need to work with your learners on population survey, population problem identification and planning course of action.
- Encourage learners to carry out projects which include gathering, organising, interpreting and sharing data about population and health concerns in the community.
- Help learners to evaluate activities of health clubs as they conclude their primary school cycle.

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Suggested Competences for Assessment

The learner:

- names types of sicknesses in a home and community.
- lists forms of anti-social behaviour and sexual deviations.
- collects information and data on human population and health in homes and the community.
- carries out population surveys and identifies community health problems.
- plans and carries out population-related health activities.
- prepares a simple report on a survey on health activities.

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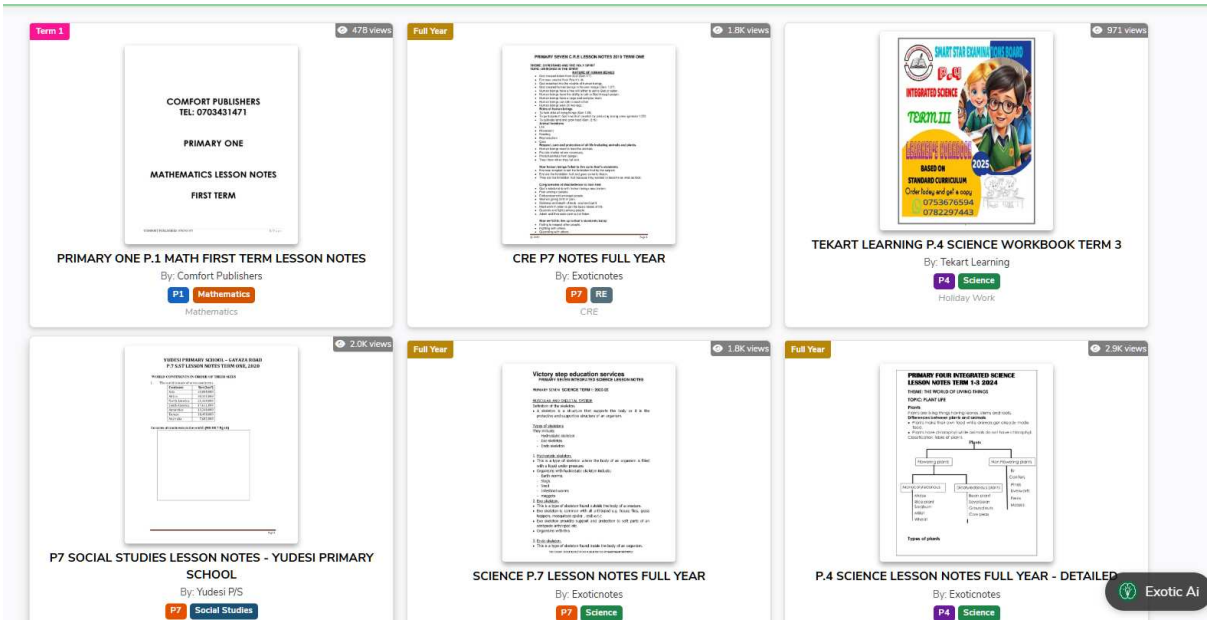
Word List

These words are considered important vocabulary in the P7 Integrated Science Syllabus. Ensure that your learners understand, can spell and use them in correct sentences.

Topic 1: Muscular – Skeletal System	Topic 2: Electricity and Magnetism	Topic 3: Energy Resources in the Environment
• Skeleton • Hinge joint • Ball and socket • Pivot joint • Gliding joint • Voluntary muscle • Involuntary muscle • Posture	• Electricity • Fuse • Circuit • Switch • Insulator • Magnet • Dynamo • Electro-magnet • Device	• Resource • Hydro • Tidal • Fossil • Coal • Petroleum • Bio gas • Bio fuel • Wood fuel
Topic 4: Simple Machines and Friction • Friction • Force • Nuisance • Moments • Mechanical advantage • Wedges • Inclined • Plane • Screws • Axles	**Topic 5: Excretory System** • Excretion • Ureter • Urinary system • Wastes	**Topic 6: Light Energy** • Beams • Translucent • Opaque • Shadows • Eclipse • Solar • Lunar • Optical • Periscope • Spectrum • Prism
Topic 7: Interdependence of Things in the Environment • Dependence • Agro-forestry • Pollarding • Lopping • Coppicing • Welfare • Rearing • Interdependence • Caring	**Topic 8: Population and Health** • Community • Demography • Survey • Data • Sex deviations • Anti social behaviours	

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