

PRIMARY SCIENCE SYLLABUS

CLASS ONE - FOUR

MINISTRY OF EDUCATION AND HUMAN RESOURCE DEVELOPMENT

BARBADOS

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ACKNOWLEDGEMENTS

The Ministry of Education and Human Resource Development expresses thanks and appreciation to the following persons for their contribution to the development of this syllabus.

Mr. Lemuel Tull	Grazettes Primary
Mr. Anderson Griffith	Gordon Greenidge Primary
Ms Maxine Walker	Sharon Primary
Mr. Darlington Maloney	St Matthias Primary
Maxine Williams	Wesley Hall Primary
Mr Wesley Griffith	Media Resource Department- Ministry of Education
Ms Joy Gittens	Ministry of Education
Ms. Pamela Hunte	Ministry of Education
Mr Laurie King	Ministry of Education

RATIONALE FOR PRIMARY SCIENCE

Science has been established as one of the four (4) core subjects at the Primary Level. Integrated Science is a powerful means of understanding the world in which we live. It is therefore necessary to expose students to the tools of Science from an early age. These tools or processes of science will not only prepare students to understand science concepts but also assist them in leading useful, productive lives since many of them are life skills.

Research supports the thinking that learning experiences and activities must be structured to provide ample opportunity for the transfer, expansion and application of knowledge and skills. To this end, the Integrated Science syllabus aims to develop students who possess an understanding of basic scientific: concepts, processes and skills which will allow them to survive in this rapidly changing scientific and technological age. These skills will be developed using practical and first-hand experiences that involve children creating their own observations, explorations and investigations. Teachers are being encouraged to use technology wherever possible, during instruction, to enhance student understanding.

This curriculum is designed to develop a nation of Barbadian children who:

- can search for cause and effect relationships;
- can function effectively and efficiently in a rapidly changing world; and
- appreciate the natural world and possess the ability to form habits that reflect respect for their environment.

Efforts should be made to instill in children, from an early age, positive attitudes towards science since first impressions are usually lasting. The teacher, using concrete experiences, should encourage students to:

1. make careful observation before writing or speaking;
2. accurately report findings obtained from research;
3. draw conclusions only when sufficient evidence is available;
4. exhibit open-mindedness and honesty;
5. respect the points of view of others.

The teaching of science should contribute to the inculcation of the following social and emotional skills, among others: **the management of time;**

being critical;

working as a member of a group;

sharing;

listening;

taking turns;

cooperating;

negotiating disputes;

being considerate and helpful.

GENERAL OBJECTIVES OF THE PRIMARY SCIENCE PROGRAMME

The Primary Science programme aims to develop students who will:

- demonstrate the ability to observe accurately and record objectively;
- use their experiences to predict outcomes and carry out investigations to test their predictions;
- draw logical conclusions from data collected;
- be more aware of the usefulness of science to man;
- develop a willingness to collect material for observation or investigation;
- possess the ability to record information in a variety of ways e.g. graphs, models, drawings and paintings;
- develop an inquiring mind and a scientific approach to solving problems;
- use technologies to conduct research or solve problems wherever possible;
- be skilled in developing generalizations which can be used to interpret and explain natural phenomena;
- hone and employ critical thinking skills;
- employ activities which foster student collaboration and co-operation;

FORMAT OF THE SYLLABUS

The Primary Science syllabus is divided into a Scope and Sequence section and a detailed syllabus document. The Scope and Sequence identifies topics with relevant Attainment Targets for each age cohort while the syllabus document provides information related to the attainment targets; relevant content; suggested activities; possible assessment activities and required resources.

The *Attainment Targets* indicate what a student should be able to achieve by the end of each school year. The *Suggested Activities* section encourages the project approach; process-approach; problem solving; group work; outdoor activities and cross-curricular activities. These activities are intended only as a guide to teachers. They are by no means prescriptive or restrictive. The literature highlights the benefits to be gained from the integrated approach to instruction. Hence, teachers are encouraged to use additional activities and take advantage of any opportunity that may arise to make the science lesson a more stimulating experience for the child. Assessment is an essential part of any educational program. Therefore, a variety of ideas for **assessment, both traditional and alternative**, is included for each topic with suggestions for grading. Teachers should employ both **assessment for learning** (Formative) and **assessment of learning** (Summative). Content is also included to provide teachers with an idea of the depth of coverage.

It is important that students are afforded the opportunity to develop scientific process skills such as: manipulation; measurement; observation; recording; reporting; predicting; hypothesizing; inferring; analyzing; interpreting and drawing (Refer to Appendix A for guidelines).

KEY TO ABBREVIATIONS USED

The following abbreviations are used to indicate the various subject areas where integration is possible:

SUBJECT	Abbreviation
Health and Family Life	HFLE
Information Technology	IT
Language Arts	LA
Mathematics	M
Music	MU
Physical Education	PE
Social/Emotional Learning	SEL
Social Studies	SS
Visual Arts	VA

SCOPE AND SEQUENCE

This section provides information on the depth of knowledge for each age cohort as well as how topics will be developed across the year groups.

Topic	Class 1	Class 2	Class 3	Class 4
Data collection, recording, display and analysis	<p>The pupil should be able to:</p> <ul style="list-style-type: none"> collect data on areas of interest; record data in a table and tally charts; illustrate data using pictographs; use information in pictographs to answer questions. 	<p>The pupil should be able to:</p> <ul style="list-style-type: none"> collect data whenever possible; record data; illustrate data in pictographs; interpret data; draw logical conclusions. 	<p>The pupil should be able to:</p> <ul style="list-style-type: none"> collect data where appropriate; record data; illustrate data in bar charts, and pie charts; interpret data; make inferences and draw conclusions from given data. 	<p>The pupil should be able to:</p> <ul style="list-style-type: none"> collect data where appropriate; record data; illustrate data in bar charts and pie charts; interpret said data; make inferences and draw conclusions from given data.

Topic	Class 1	Class 2	Class 3	Class 4
Skill Development	<p>The pupil should be able to:</p> <ul style="list-style-type: none"> manipulate apparatus measure quantities make predictions make accurate observations record observations report orally and in writing on findings draw diagrams to demonstrate knowledge of key concepts classify items using distinctive features arrange items to complete a sequence analyze data draw inferences 	<p>The pupil should be able to:</p> <ul style="list-style-type: none"> manipulate apparatus measure quantities make predictions make accurate observations record observations report orally and in writing on findings draw diagrams to demonstrate knowledge of key concepts classify items using distinctive features arrange items to complete a sequence analyze data draw inferences develop logical hypotheses 	<p>The pupil should be able to:</p> <ul style="list-style-type: none"> manipulate apparatus measure quantities make predictions make accurate observations record observations report orally and in writing on findings draw diagrams to demonstrate knowledge of key concepts classify items using distinctive features arrange items to complete a sequence analyze data draw inferences develop logical hypotheses 	<p>The pupil should be able to:</p> <ul style="list-style-type: none"> manipulate apparatus measure quantities make predictions Make accurate observations record observations report orally and in writing on findings draw diagrams to demonstrate knowledge of key concepts classify items using distinctive features arrange items to complete a sequence analyze data draw inferences develop logical hypotheses

Topic	Class 1	Class 2	Class 3	Class 4
<p>Living Things</p>	<p>The pupil should be able to:</p> <p>recall the characteristics of living things (Inf B)</p> <p>discuss the importance of the needs of living things. name examples of both plants and animals;</p> <p>list difference between plants and animals;</p> <p>state reasons for the differences between plants and animals;</p> <p>draw a labeled diagram of a typical flowering plant;</p> <p>state one function EACH of the root, leaf and fruit;</p> <p>discuss what would happen if any of these parts is missing, or malfunctioning</p>	<p>The pupil should be able to:</p> <p>list characteristics of living things (growth; movement; feeding/nutrition, excretion; reproduction; sensitivity)</p> <p>discuss why reproduction; excretion and sensitivity are important to living things</p> <p>compare characteristics of plants and animals;</p> <p>discuss the interdependence of plants and animals;</p> <p>list adaptations for plants living in the desert, rain forest and swampy conditions;</p>	<p>The pupil should be able to:</p> <p>discuss the importance of flowers in the life cycle of a plant;</p> <p>identify the parts of the flower;</p> <p>state the functions of the parts of the flower;</p> <p>explain how fruits develop from flowers;</p> <p>discuss the importance of fruit formation.</p>	<p>The pupil should be able to:</p> <p>list common plant adaptations;</p> <p>discuss how adaptations assist plant survival;</p> <p>state ways how plants are propagated;</p> <p>classify crops according to method of propagation;</p> <p>discuss the advantages of propagating plants without using seeds;</p> <p>monitor the growth of a plant (crop);</p> <p>record information related to plant growth;</p> <p>describe plant growth for named crops (plants);</p> <p>plot graphs to represent plant growth patterns.</p>

Topic	Class 1	Class 2	Class 3	Class 4
Living things	<p>The pupil should be able to:</p> <p>classify crops based on the part of the plant which is eaten;</p> <p>identify tap and fibrous roots; classify crops as tap or fibrous roots;</p> <p>identify some common flowers found in Barbados;</p> <p>describe some common flowers found in Barbados;</p>	<p>The pupil should be able to:</p> <p>define the term germination;</p> <p>identify the requirements of a growing plant;</p> <p>state the importance of each requirement;</p> <p>describe experiments to ascertain basic requirements of plants</p> <p>state the importance of each requirement;</p> <p>describe experiments to ascertain basic requirements of plants;</p>	<p>The pupil should be able to:</p> <p>explain why plants are classified as living things;</p> <p>classifying plants as trees, herbs, vines and shrubs;</p> <p>list the characteristics of trees; herbs, vines and shrubs;</p> <p>discuss the usefulness of trees, herbs and shrubs;</p>	

Topic	Class 1	Class 2	Class 3	Class 4
Living things	<p>The pupil should be able to:</p> <p>recall the names of diurnal and nocturnal animals;</p> <p>classify animals as diurnal or nocturnal;</p> <p>compare characteristics of diurnal and nocturnal animals:</p> <p>list the names of animals that are predators and prey:</p> <p>classify animals as predator or prey:</p>	<p>The pupil should be able to:</p> <p>classify animals as vertebrates and invertebrates;</p> <p>classify invertebrates as insects and non-insects;</p> <p>discuss the usefulness of insects</p> <p>identify insects which are harmful;</p> <p>discuss the harmful effects of insects;</p> <p>classify animals as insects and non-insects;</p> <p>state two characteristics of insects;</p> <p>list the stages in the life cycle of the butterfly;</p> <p>describe the life cycle of the butterfly.</p>	<p>The pupil should be able to:</p> <p>discuss why animals are classified as living things;</p> <p>define the terms vertebrate and invertebrate;</p> <p>classify organisms as vertebrates or invertebrates;</p> <p>cite examples of vertebrates and invertebrates;</p> <p>classify vertebrates as amphibian, reptiles, birds, fish or mammals;</p> <p>state at least two characteristics for EACH group of vertebrate</p>	

Topic	Class 1	Class 2	Class 3	Class 4
Living things		<p>The pupil should be able to:</p> <p>compare the life cycle of the butterfly with that of the housefly and the frog (non-insect);</p> <p>define the term camouflage;</p> <p>state examples of camouflage in the insect world;</p> <p>explain the importance of camouflage.</p>		

Topic	Class 1	Class 2	Class 3	Class 4
<p>The Human Body</p>	<p>The pupil should be able to:</p> <ul style="list-style-type: none"> list the names of the internal organs of the human body; identify the organs on a diagram or model; state one function EACH for the heart, lungs and brain; discuss the effects on the body if any of the organs malfunction; name some common pieces of safety equipment; describe how EACH piece of safety equipment protects the body. 	<p>The pupil should be able to:</p> <ul style="list-style-type: none"> label the organs of the human body; state the functions of the liver, skin and kidneys; label parts of the skin; list functions of named parts of the skin; discuss the impact of high temperatures on human beings identify ways in which people try to keep cool; describe how the body tries to keep itself cool. 	<p>The pupil should be able to:</p> <ul style="list-style-type: none"> list the nutrients found in foods; identify the main nutrient in given foods; classify foods as grow, glow and go foods; discuss the importance of various food types to the body; evaluate the nutritional nature of different meals; identify organs which contribute to the digestion of food substances. 	<p>The pupil should be able to:</p> <ul style="list-style-type: none"> label a diagram of the heart (chambers and blood vessels); describe how the heart beats; describe the effect of exercise on heart beat; explain why this effect is manifested; conduct experiments to investigate the effect of exercise on heart rate; display the data in an appropriate manner; interpret data from a given graph.

Topic	Class 1	Class 2	Class 3	Class 4
The Human Body				<p>The pupil should be able to:</p> <p>Discuss the importance of water in the human body;</p> <p>Relate the properties of water to its functions in the human body;</p>

Topic	Class 1	Class 2	Class 3	Class 4
Ecology	<p>The pupil should be able to:</p> <p>define the term habitat;</p> <p>describe different habitats on land and in the sea;</p> <p>identify organisms found in the various habitats;</p> <p>discuss how animals are equipped to survive in various habitats e.g. tropics, temperate, desert, air, marsh, aquatic.</p>	<p>The pupil should be able to:</p> <p>create food chains made up of three organisms;</p> <p>define the terms producer and consumer;</p> <p>classify organisms as producers; consumers; prey and predators;</p>	<p>The pupil should be able to:</p> <p>list items for which animals depend on plants ;</p> <p>define the term photosynthesis;</p> <p>recall what food chains are;</p> <p>construct a food web;</p> <p>identify food chains present in a food web;</p> <p>discuss the impact of removing any named organism from the food web.</p>	<p>The pupil should be able to:</p> <p>describe a coral reef;</p> <p>list reasons why a coral reef is a habitat or ecosystem</p> <p>identify organisms that inhabit coral reefs;</p> <p>discuss the importance of coral reefs in the Caribbean;</p> <p>discuss how human beings contribute to coral reef destruction.</p>

Topic	Class 1	Class 2	Class 3	Class 4
Agricultural Science	<p>The pupil should be able to:</p> <ul style="list-style-type: none"> define Agriculture; name five crops grown in the region; list three reasons why agriculture is important; identify hand tools used to prepare garden beds; draw diagrams of the hand tools; state the uses of the hand tools; use simple tools to prepare an area for planting a crop 	<p>The pupil should be able to:</p> <ul style="list-style-type: none"> prepare a suitable seed-box, tray or tyre garden for planting; transplant seedlings; explain why transplanting is necessary; cultivate crops; keep simple records related to crops grown 	<p>The pupil should be able to:</p> <ul style="list-style-type: none"> discuss the importance of agriculture in Barbados; list three examples of livestock reared in the Caribbean region; define the term poultry; identify the three types of poultry; discuss the importance of poultry to man; name poultry used for food; list important steps involved in the rearing chickens 	<p>The pupil should be able to:</p> <ul style="list-style-type: none"> define the term livestock; list three breeds of cattle reared in the Caribbean; name the two types of cattle; describe the two types of cattle; name products of the raw materials obtained from cattle; discuss the importance of cattle to Agriculture in the Caribbean

Topic	Class 1	Class 2	Class 3	Class 4
Agricultural Science	<p>The pupil should be able to:</p> <p>list safety measures used when handling tools;</p> <p>cultivate a crop e.g. beans;</p> <p>record activities related to cultivation of the crop.</p>			<p>The pupil should be able to:</p> <p>define the term aquaculture; name three fish reared;</p> <p>describe how the fish farms are created;</p> <p>state two advantages of aquaculture;</p> <p>list two disadvantages of aquaculture</p>

Topic	Class 1	Class 2	Class 3	Class 4
Natural Resources	<p>The pupil should be able to:</p> <ul style="list-style-type: none"> identify sources of water; list uses of water; classify objects depending on whether they sink or float; list properties of items that sink and float; relate properties of items that sink or float to safety devices for swimming. 	<p>The pupil should be able to:</p> <ul style="list-style-type: none"> sequence the events of the water cycle; define evaporation, condensation and precipitation; list ways of conserving water; discuss the importance of water conservation 	<p>The pupil should be able to:</p> <ul style="list-style-type: none"> define the terms soluble and insoluble; classified substances as soluble/insoluble in water; outline experiments to ascertain whether substances are soluble or insoluble; state the factors that affect rate of dissolving of solids; relate rate of dissolving to food preparation; investigate factors that influence the rate of evaporation of water; list the factors that affect rate of evaporation of water; apply knowledge of rate of evaporation to drying of laundry and other household chores. 	<p>The pupil should be able to:</p> <ul style="list-style-type: none"> define the term soil; name different types of soil; describe the different soil types (clay, loam and sand); monitor plant growth in various soil types; discuss the effects of soil type on plant growth; demonstrate soil erosion; discuss the harmful effects of soil erosion.

Topic	Class 1	Class 2	Class 3	Class 4
Natural Resources			<p>The pupil should be able to:</p> <ul style="list-style-type: none"> define term atmosphere; list characteristics of air; discuss the importance of air to man; name two pollutants of air; discuss the harmful effects of common air pollutants. 	

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Topic	Class 1	Class 2	Class 3	Class 4
Matter	<p>The pupil should be able to:</p> <p>list the three states of matter;</p> <p>name at least three substances that exist in EACH of the three states;</p> <p>cite at least two characteristics EACH for solids and liquids and one for gases.</p>	<p>The pupil should be able to:</p> <p>state three characteristics of each state of matter;</p> <p>state definitions for the changes of state: melting; freezing; evaporation; condensation</p> <p>classify changes experienced daily as melting; freezing; evaporation and condensation.</p>	<p>The pupil should be able to:</p> <p>describe the arrangement of particles in the three states of matter;</p> <p>account for the properties of the different states based on arrangement of particles;</p> <p>define the terms solidification sublimation;</p> <p>cite examples of solidification and sublimation;</p> <p>discuss the usefulness of sublimation and freezing;</p> <p>discuss a hazard of solidification/freezing.</p>	<p>The pupil should be able to:</p> <p>use knowledge of states of matter to account for the use to which common items is put;</p> <p>classify changes of state;</p> <p>describe changes of state based on particle arrangement.</p>

Topic	Class 1	Class 2	Class 3	Class 4
Weather	<p>The pupil should be able to:</p> <p>describe the weather based on observations;</p> <p>record weather conditions using simple weather charts;</p> <p>distinguish weather conditions by examining charts using given keys;</p> <p>distinguish daily weather conditions using terms such as hotter/warmer than, cooler than, more windy, from data collected</p> <p>define the term wind</p> <p>discuss the effects of wind on objects;</p> <p>identify instruments for measuring wind speed, wind direction and rainfall.</p>	<p>The pupil should be able to:</p> <p>identify types of clouds;</p> <p>discuss the type of weather associated with various clouds;</p> <p>construct simple instruments for checking wind strength and direction, and measuring rainfall;</p> <p>use the instruments to measure wind strength, direction and rainfall amounts;</p> <p>discuss the effect of weather on a person's dress.</p>	<p>The pupil should be able to:</p> <p>describe how rain is formed;</p> <p>monitor rainfall pattern;</p> <p>analyze rainfall data;</p> <p>measure and record temperature in a particular location over a period of time;</p> <p>explain changes in temperature over a period of time.</p>	<p>The pupil should be able to:</p> <p>define the terms weather and climate;</p> <p>state the period when hurricane season is active;</p> <p>list the characteristics of tropical depressions, storms and hurricanes;</p> <p>describe how hurricanes are formed;</p> <p>label the parts of the hurricane;</p> <p>discuss the need for hurricane preparedness.</p>

Topic	Class 1	Class 2	Class 3	Class 4
Energy	<p>The pupil should be able to:</p> <p>identify sounds in the immediate environment;</p> <p>generate a variety of sounds;</p> <p>classify sounds - loud or soft, high or low;</p> <p>classify sounds as nuisance or useful;</p> <p>name the organ used for hearing;</p> <p>name objects in the sky that provide light;</p> <p>classify these objects as sources or non-sources of light.</p>	<p>The pupil should be able to:</p> <p>list at least three (3) sources of light;</p> <p>discuss why light is important to man;</p> <p>explain why light is important to plants;</p> <p>investigate the passage of light through an assortment of material;</p> <p>classify materials as transparent, opaque and translucent;</p> <p>compare transparent, opaque and translucent materials;</p> <p>explain how shadows are formed.</p>	<p>The pupil should be able to:</p> <p>list ways in which solar energy is used;</p> <p>discuss the importance of solar energy to man;</p> <p>discuss the impact of solar energy on man.</p>	<p>The pupil should be able to:</p> <p>list the different types of energy;</p> <p>identify the energy transformations which occur in common household items.</p>

Topic	Class 1	Class 2	Class 3	Class 4
Energy	classify light sources as artificial and natural; discuss the importance of light in our daily lives.	The pupil should be able to: name the organ used for hearing; discuss the importance of hearing; name common musical instruments; describe how the instruments produce sound.		

Topic	Class 1	Class 2	Class 3	Class 4
Forces	<p>The pupil should be able to:</p> <p>define a push, pull and twist;</p> <p>classify forces as a push, pull or twist;</p> <p>differentiate among a push, pull or twist.</p>	<p>The pupil should be able to:</p> <p>list uses of magnets;</p> <p>state the material magnets are made of;</p> <p>classify materials as magnetic/non-magnetic;</p> <p>discuss the importance of magnets to man;</p> <p>plan and design an experiment to measure the strength of a magnet.</p>	<p>The pupil should be able to:</p> <p>construct an electromagnet;</p> <p>identify items which contain electromagnets</p> <p>state one difference between magnets and electromagnets.</p>	<p>The pupil should be able to:</p> <p>define gravity;</p> <p>explain gravity in relation to falling objects;</p> <p>make a parachute;</p> <p>explain how parachutes work to counteract gravity;</p> <p>define friction;</p> <p>factors that affect friction;</p> <p>discuss how friction is useful to man.</p>

Topic	Class 1	Class 2	Class 3	Class 4
Forces				<p>The pupil should be able to:</p> <p>define the term “machine”;</p> <p>name five simple machines used in the home;</p> <p>Identify common objects that are levers ;</p> <p>state how the levers are used by man;</p> <p>demonstrate how levers operate.</p>

Topic	Class 1	Class 2	Class 3	Class 4
Solid Waste	<p>The pupil should be able to:</p> <p>define the term litter;</p> <p>classify litter items;</p> <p>list reasons why we should not litter;</p> <p>discuss appropriate disposal of litter;</p> <p>compile a list of actions/rules for keeping the school grounds litter free;</p> <p>define the terms natural and man-made as they relate to litter;</p> <p>classify litter as natural or man-made;</p> <p>identify items that can be reused;</p> <p>describe how the items can be reused.</p>	<p>The pupil should be able to:</p> <p>define the terms reduce, reuse and recycle;</p> <p>classify litter as recyclable or non-recyclable;</p> <p>describe how one of paper, glass or aluminium is recycled;</p> <p>discuss the importance of recycling as it relates to Barbados</p>	<p>The pupil should be able to:</p> <p>define the term bio-degradable;</p> <p>classify garbage as biodegradable or non-bio-degradable;</p> <p>discuss why composting is a practice that should be encouraged;</p> <p>describe how a compost heap is established;</p> <p>construct a compost heap as a strategy for waste disposal;</p>	<p>The pupil should be able to:</p> <p>define the term solid waste;</p> <p>define the term landfill;</p> <p>state the name of a landfill in Barbados;</p> <p>describe how a landfill works;</p> <p>discuss the need to reduce the volume of solid waste in Barbados;</p> <p>list ways of reducing the amount of solid waste produced in the school/ home;</p> <p>list some large items that are disposed of in an indiscriminate manner;</p> <p>discuss the effects of indiscriminate dumping on the environment.</p>

CLASS ONE SYLLABUS DOCUMENT

TOPIC: DATA COLLECTION

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Collect data on areas of interest;</p> <p>Illustrate data using tables and tally charts;</p> <p>Illustrate data using pictographs;</p> <p>Interpret information given in diagrams.</p>	<p>Data collection is the gathering of information about a specific topic or theme.</p> <p>Data can be presented in tally charts or table.</p> <p>Data can be represented graphically.</p> <p>Types of graphs are: pictograms, bar charts, pie charts and line graphs.</p> <p>Questions related to the data may be used to assist students with forming conclusions about findings.</p>	<p>When the topic lends itself to data collection students should gather data, record it in tally sheets, construct pictographs and analyze the findings.</p> <p>Provide students with data for them to produce pictographs and provide answers to given questions</p> <p>graphs to be provided for students to analyze and then participate in whole class discussion</p>	<p>Projects involving data collection, recording and analysis. Assessment should include accuracy of the data collected, accuracy of pictograph and the inferences formed.</p> <p>Students can be questioned, on an individual basis, about various sets of data.</p> <p>Data analysis questions for students to interact with the data and write their responses.</p>	<p>Paper</p> <p>Computer with internet access</p> <p>crayons</p>

TOPIC: Skill Development

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>The pupil should be able to:</p> <p>Manipulate apparatus</p> <p>Measure quantities</p> <p>Make predictions</p> <p>Make accurate observations</p> <p>Record observations</p> <p>Report orally and in writing on findings</p> <p>Make drawings to demonstrate knowledge of key concepts</p> <p>Classify items using distinctive features</p> <p>Arrange items to complete a sequence</p> <p>Analyze data</p> <p>Draw inferences</p> <p>Develop logical hypotheses</p>	<p>Science education involves the building of process skills while learning content and interacting with concepts.</p> <p>Skill acquisition and development should be an integral part of every lesson.</p> <p>Science process skills are: observing; recording; reporting; classifying; sequencing; inferring; hypothesizing; measuring; predicting; experimenting; analyzing</p>	<p>Scenarios for students to analyze.</p> <p>Practical activities for students to predict outcomes; execute; document findings and analyze the data.</p> <p>Oral and multimedia presentations</p>	<p>Any activity which lends itself to development of skills. These should include execution and documentation of experiments; posters; booklets; skits; written tests; games; oral and multimedia presentations; show and tell and models</p>	<p>Paper</p> <p>Card</p> <p>Computer with internet access</p>

TOPIC: Living Things

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>The pupil should be able to:</p> <p>Recall the characteristics of living things (Inf B)</p> <p>Discuss the importance of the needs of living things. name examples of both plants and animals;</p> <p>List differences between plants and animals;</p> <p>State reasons for the differences between plants and animals;</p>	<p>All living things can move, grow, feed, reproduce, breathe, excrete and display sensitivity. N.B. – defeacation is not an example of excretion</p> <p>The characteristics of living things ensure preservation of individuals as well as the species.</p> <p>Plants are living things with leaves which make food to sustain them. They have other parts namely, the root; stem; flower; fruit and seed. Plant movement is limited to its parts.</p> <p>Animals come in various shapes and sizes. They are capable of locomotion and move from place to place. Their bodies are made up of numerous parts each of which performs a specific function.</p>	<p>Pictures for students to group and complete a worksheet, giving reasons for the choices. Conclude with class discussion.</p> <p>Guided discussion to assist with characteristics of living things. Pictures may be used if students do not exhaust list. Students to work collaboratively and produce charts.</p> <p>Slideshow, pictures or nature walk – students to classify living things as plant or animal with reasons.</p> <p>Think-peer-share on why animals and plants differ in structure.</p> <p>Guided discussion on why plants and animals are different. Teacher may also provide reading material as a stimulus. Note to be generated using students’ responses.</p>	<p>Objective tests on living things.</p> <p>Organisms for students to classify with reasons</p> <p>The chart on characteristics of living things using a rubric. Assessment may include spelling, content, use of graphics, visual impact</p> <p>A fact booklet comparing plants and animals. Assess expression, content, accuracy of information, appeal.</p>	<p>Card Glue Crayons Paper Camera Video tape of living things</p>

TOPIC: Living Things

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>The pupil should be able to:</p> <p>Draw a labeled diagram of a typical flowering plant;</p> <p>State one function EACH of the root, leaf and fruit;</p> <p>Discuss what would happen if any of these parts is missing, or malfunctioning.</p>	<p>Leaves – absorb sunlight/take in carbon dioxide/ make food for the plant</p> <p>roots- absorb water and nutrients/ keeps the plant stable in the soil</p> <p>Stem- transports water roots to the other parts of the plant/ transports food from leaves to other parts for storage</p> <p>Flower- reproductive organs/ develops into the fruit</p> <p>Fruits- protect the seeds/ storage organ for food</p>	<p>Nature walk to observe plants and name the parts. Students to label diagram of a typical flowering part. Drawing of plants should be practiced.</p> <p>Brainstorming to find out what students know about the functions of plant parts. Research to gather information that is lacking.</p> <p>Reading comprehension – students to be given passage on functions of plant parts.</p> <p>Vocabulary should be addressed before students are requested to read. In pairs students to answer questions. Discussion to follow.</p> <p>Students to draw a plant with a specified part missing and discuss what they think would happen to the plant. Discussion session. Note based on students' responses.</p>	<p>Objective tests</p> <p>Essay - My life as a plant. The checklist should cover vocabulary, content – volume and accuracy, creativity, cohesiveness and appeal.</p> <p>A poster to be used as a teaching aid. Assessment may include visual impact, volume of content, accuracy.</p>	<p>Plants</p> <p>Pictures</p> <p>Books</p> <p>Internet</p>

TOPIC: Living things

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Classify crops based on the part of the plant which is eaten;</p> <p>Identify tap and fibrous roots; classify crops as tap or fibrous roots;</p> <p>Identify some common flowers found in Barbados;</p> <p>Describe some common flowers found in Barbados;</p>	<p>Crops are plants grown by farmers to provide food for humans and other animals. Crops can be grouped or classified based on the part which is eaten.</p> <p>Types of crops: Leafy – cabbage, lettuce fruit/orchard – orange, plum, ackee Root – carrot, beet,</p> <p>A tap root is a single, large root originating from the base of the stem/trunk. A fibrous root system is one made of numerous tiny roots growing from one location. Hibiscus, Rose, Pride of Barbados, and Daisy</p> <p>Number of petals, colour and size can be used as features for describing the flowers</p>	<p>Pictures of different crops for students to group based on part of plant eaten. Information to be recorded in a table.</p> <p>Root specimens/ pictures to be provided for students to place into two groups with reasons. Teacher to provide terms for students to decide which represent the groups. Discussion to follow.</p> <p>Nature walk/ visit to plant nursery/specimens/multimedia</p>	<p>Activity where students are to classify crops from pictures.</p> <p>Show and tell – students to bring produce and share information with class.</p> <p>Students to classify crops from either pictures or descriptions of the root systems.</p> <p>Fact book on the various root systems. The product can be assessed for volume, quality and relevance of content; creativity;</p> <p>Colouring book displaying characteristics of flowers</p>	<p>Charts Plant specimens Pictures Texts Computer with internet access and printer Digital camera camcorder</p>

TOPIC: Living Things

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Recall the names of diurnal and nocturnal animals;</p> <p>Classify animals as diurnal or nocturnal;</p> <p>Compare characteristics of diurnal and nocturnal animals:</p>	<p>Diurnal animals are ones which are active during the day and rest at night. Sheep, cows, doves, cats, blackbirds, dogs, lizards and human beings are diurnal animals.</p> <p>Nocturnal animals are more active in the night. Examples of are: mice, rats, fruit bats, owls, skunks, raccoons and turtles.</p> <p>Many diurnal animals rely on camouflage to protect themselves from their enemies. Others spend most of the time in the shade to stay safe from the sun's heat.</p> <p>Nocturnal animals have large eyes; sensitive ears or a keen sense of smell to help them locate prey or avoid predators.</p>	<p>Students to be shown a few pictures of both diurnal and nocturnal animals for them to provide definitions.</p> <p>Research on internet to gather information on nocturnal animals.</p>	<p>In class activity for students to classify organisms as diurnal and nocturnal</p> <p>A brochure on habitats drawing or pictures to be included. Assessment should cover inclusion of graphics, language and content.</p> <p>Oral presentations to be judged on audience appeal, language, creativity, content (volume and accuracy).</p> <p>Written test</p> <p>A mobile on nocturnal animals. It should be assessed for creativity, volume of content, accuracy of the information and visual impact.</p>	<p>Pictures of animals' homes</p> <p>Pictures of animals that show physical details e.g. Appendages, skin etc</p> <p>Magazines/Journals</p> <p>Video tapes of animals in their habitats</p> <p>Access to the internet</p>

TOPIC: Living Things

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
List the names of animals that are predator and prey; Classify animals as predator or prey.	A predator is any animal which hunts and kills other animals to obtain food. Animals which are hunted are called prey.	Video of animals in their habitats displaying predator-prey relationships. Student to develop working definitions of predator and prey, as well as named examples	Poster depicting predator-prey relationships/ classifying predator and prey	Video pictures

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TOPIC: Ecology

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Define the term habitat;</p> <p>Describe different habitats on land and in the sea;</p> <p>Identify organisms found in the various habitats;</p> <p>Discuss how animals are equipped to survive in various habitats e.g. tropics, temperate, desert, air, marsh, aquatic);</p>	<p>A habitat is any place in which an organism resides and provides all that the organism needs to survive.</p> <p>A habitat provides the organism with food; safety; shelter and water. Organisms in a habitat depend on each other for their survival. Examples of habitats are: a pond, tree, sea, pasture; desert; rain-forest</p> <p>Animals are adapted to survive in different environments. Tropics – lack of thick hair/fur; ability to burrow; temperate – thick hair/fur, blubber; ability to hibernate</p>	<p>Teacher to show pictures or video of different habitats as stimulus for students to write a definition for the term habitat. Students to share definitions.</p> <p>Each group to be given a particular habitat (picture or video clip). A nature walk/ field trip can also be used. Students to describe the habitat and note organisms present.</p> <p>Drawings of organisms should also be included.</p> <p>Students to research organisms in a particular habitat to ascertain adaptations. Oral presentations to follow.</p>	<p>A brochure on habitats drawing or pictures to be included.</p> <p>Assessment should cover inclusion of graphics, language and content.</p> <p>Oral presentations to be judged on audience appeal, language, creativity, content (volume and accuracy).</p> <p>Written test</p> <p>Skit or dialogue to share information on animal adaptation for survival.</p>	<p>Pictures of animals' homes</p> <p>Pictures of animals that show physical details e.g. Appendages, skin etc</p> <p>Magazines/Journals</p> <p>Video tapes of animals in their habitats</p> <p>Access to the internet</p>

TOPIC: Agricultural Science (Applied Science)

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Define Agriculture;</p> <p>Name at least five crops grown in the region;</p> <p>List three reasons why agriculture is important;</p>	<p>Agriculture is the growing of crops and rearing of animals.</p> <p>Sugar Cane; cocoa; banana; citrus fruit; mango; sweet potato; onion; sweet peppers</p> <p>Agriculture is important in the Caribbean because it provides jobs; food; money and raw materials.</p>	<p>Display pictures, PowerPoint or video of persons involved in agricultural activities for student to generate a definition.</p> <p>Research on Agriculture in the region. Using a map of the Caribbean students to list at least three crops grown in each of five of the islands.</p> <p>Think-pair-share on why Agriculture is important. This should be followed by class discussion, Teacher to generate list of reasons.</p>	<p>Pen and paper test</p> <p>Poster on the importance of Agriculture. Assess for accuracy and volume of content; creativity; impact and grammar.</p>	<p>Pictures</p> <p>Video</p> <p>Card</p> <p>Paper</p> <p>Markers</p> <p>Internet</p>

TOPIC: Agricultural Science (Applied Science)

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Identify hand tools used to prepare garden beds;</p> <p>Draw diagrams of the hand tools;</p> <p>State the uses of the hand tools;</p> <p>Use simple tools to prepare an area for planting a crop;</p>	<p>Farmers need tools to prepare the land and care for the crops and livestock.</p> <p>Axe/cutlass – to cut down trees or shrubs</p> <p>Handfork – to remove weeds/ dig holes to accommodate seedlings or seeds</p> <p>Hoe – to remove weeds/ shape the garden bed</p> <p>Fork – to turn over soil</p> <p>Rake – to pull items into a heap</p> <p>Wheelbarrow - to transport equipment/ soil/ produce</p> <p>Watering can/ hose – to water the garden/crops</p>	<p>Use actual tools, pictures or video for students to identify tools and indicate their uses. Information to be recorded in a worksheet.</p> <p>Tools for students to draw large labelled diagrams.</p> <p>Students to make 3D hand-tools using any medium (AC)</p> <p>Students to use tools to prepare a garden bed for planting a crop</p> <p>Students to prepare area for planting and give oral explanation.</p>	<p>Drawings to be assessed using criteria for drawing. (appendix a)</p> <p>The tools created using a rubric/checklist</p> <p>The process of bed preparation using manipulation, correct use of tools, proper sequence of events and quality of the bed.</p>	<p>Simple hand tools</p> <p>Garden plot / tyre Garden</p> <p>Paper</p> <p>Card</p> <p>Pictures of tools</p> <p>Video tape</p> <p>Digital camera</p>

TOPIC: Agricultural Science

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>List safety measures used when handling tools;</p> <p>Cultivate a crop e.g. beans;</p> <p>Record activities related to cultivation of the crop.</p>	<p>Check tools for splinters or flaking metal; carry tools with the blade facing away from body; ensure that there is enough space to use the tool efficiently/ avoid working too close to others; keep hands and feet out of the path of the tool;</p> <p>Activities should include: sowing; transplanting; weeding; watering; mulching Reaping</p>	<p>Brainstorming session on safety measures to be followed when using tools. Students to generate a list for each of five tools Students to sow seeds, monitor development of the crop; document observations and activities involved in rearing the crop.</p> <p>Students to work in small groups and research transplanting. Discussion session to follow.</p> <p>Cultivate a crop grown from seeds from planting to harvest. Records of plant growth should be kept as well as the activities involved in caring for the crop.</p>	<p>Safety booklet on the handling of garden tools. Usefulness of information, accuracy, volume, expression and impact may be assessed.</p> <p>Documents to be assessed for volume and accuracy of observations, and reporting using a checklist.</p>	<p>Tools</p> <p>Computer with internet access</p>

TOPIC: Natural Resources

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Identify sources of water;</p> <p>List uses of water;</p> <p>Classify objects depending on whether they sink or float;</p> <p>List properties of items that sink and float;</p> <p>Relate properties of items that sink or float to safety devices for swimming.</p>	<p>Common sources of water are: pond; lake; sea; ocean; well; spring; clouds</p> <p>Water is used washing; bathing; quenching thirst; cooking; recreation</p> <p>Items float in water if they are less dense (lighter) than water. This is usually true of items filled with air. Items which are denser (heavier) than water sink when placed in water.</p>	<p>Teacher to show sources of water for students to list.</p> <p>Write poems/ stories on Sources/uses of water (LA). Use a rubric and assess language, creativity and content.</p> <p>In groups students to generate list of uses of water.</p> <p>Experiment on sinking and floating. Students to record findings in table.</p> <p>Students to use information from the practical activity to list properties of items that sink and float. Discussion and note session to follow.</p> <p>In small groups students to research flotation devices and list common properties. Guided discussion session to focus students on how flotation devices function.</p>	<p>Write poems/ stories on Sources/uses of water (LA). Use a rubric and assess language, creativity and content.</p> <p>Write-up of the experiment to be assessed for observations, recording, classification, inferring and predicting.</p> <p>Written exercises</p> <p>An information booklet on flotation devices. The rubric or checklist should include creativity, content, language and audience appeal.</p>	<p>Transparent containers</p> <p>Variety of objects</p> <p>Computer with internet access</p>

TOPIC: Matter

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>List the three states of matter;</p> <p>Name at least three substances that exist in EACH of the three states;</p> <p>Cite at least two characteristics EACH for solids and liquids and one for gases;</p>	<p>The three states of matter are:</p> <ol style="list-style-type: none"> 1. Solid – wood, glass, plastic, iron, leather, ice 2. Liquid – water, apple juice, milk, oil, alcohol 3. Gas – oxygen, helium, nitrogen, carbon dioxide <p>Solids are hard/ firm and have a shape; liquids can flow/ be poured and take the shape of the container; gases can flow and they spread out quickly.</p>	<p>Teacher to supply each group with a number of substances to observe and interact with. Students to complete a worksheet which requires them to group the items and give reasons for choices. Discussion to follow where teacher organises the information.</p> <p>Research on states of matter for students to obtain names for the groups, as well as any other relevant information.</p> <p>Game for students to match state of matter with examples and characteristics. Students to write information in books at end of game.</p> <p>Word search for students to find hidden terms and then write information about each.</p>	<p>Each group of students to be given a different state of matter to research and then produce a colouring/ information book. The teacher should create the appropriate rubric to include volume of content, accuracy, appropriateness of graphics, language, creativity and visual impact</p> <p>Objective tests</p> <p>Written structured questions.</p> <p>Oral presentation on states of matter. Access for accuracy of content; volume and language.</p>	<p>Substances/objects</p> <p>Textbooks</p> <p>Video clips</p> <p>Camcorder/digital camera</p> <p>Computer with internet access</p>

TOPIC: Weather

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Describe the weather based on observations;</p> <p>Record weather conditions using simple weather charts;</p> <p>Distinguish weather conditions by examining charts using given keys;</p> <p>Distinguish daily weather conditions using terms such as hotter/warmer than, cooler than, more windy, from data collected</p>	<p>Weather is the condition of the atmosphere at a particular time. The elements of weather are: sunshine; precipitation; cloud cover; temperature; wind speed and wind direction.</p> <p>Sunny - sun Rainy - raindrop/ cloud with rain Stormy – gray cloud with lightning Windy – windmill/ wind sock Cloudy – cloud High temperature - thermometer</p>	<p>Brainstorming to ascertain students’ understanding of the term weather and what it involves.</p> <p>Students to walk around school and note weather conditions. Teacher and students to determine symbols to be used to depict different aspects of the weather.</p> <p>Students to observe the weather for a week. Temperatures to be obtained from the newspaper. Information to be used to construct weather charts.</p> <p>Data analysis questions based on weather charts for students to analyze.</p>	<p>Role-playing activity – students to perform role of weather forecaster based on weather chart supplied by teacher. Assess diction, language, volume and accuracy of content, creativity.</p> <p>Questions which require students to analyse data and make judgements.</p>	<p>Newspaper clippings</p> <p>Weather charts</p> <p>Pictures (still/ video)</p>

TOPIC: Weather

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Define the term wind</p> <p>Discuss the effects of wind on objects;</p> <p>Identify instruments for measuring wind speed, wind direction and rainfall;</p>	<p>Wind is moving air. The speed of wind varies. Winds calm – leaves/branches are still; breeze- leaves rustle; gale – twigs break from trees; storm – widespread damage to crops, trees and buildings; hurricane – severe damage to buildings and vegetation</p> <p>Wind speed – anemometer Wind direction – wind vane/ wind sock Rainfall – rain gauge</p>	<p>Students to use discarded materials to make wind vanes and wind socks. The instruments should be used to obtain wind direction and strength.</p> <p>Teacher to discuss scales and provide examples as stimulus. Students to use thermometers and take temperatures of objects. Data should be used to calculate differences in temperatures. (M)</p>	<p>The weather instruments made can be assessed for functionality, creativity and visual impact.</p> <p>Oral presentations on how to make the weather instruments and how they function. Assessment should address detail, language, confidence, audience appeal, content, vocabulary.</p> <p>Practical activity involving measuring temperatures and noting readings. Include calculations. Write up to be submitted. Assess manipulation, measurement, observation, recording and calculation.</p> <p>Matching activity.</p>	<p>Newspaper clippings</p> <p>Weather charts</p> <p>Pictures (still/ video) Discarded material Thermometer http://www.cdli.ca/CITE/weather.htm</p>

TOPIC: Energy (Light)

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Name objects in the sky that provide light;</p> <p>Classify these objects as sources or non-sources of light;</p> <p>Classify light sources as artificial and natural;</p> <p>Discuss the importance of light in our daily lives.</p>	<p>Objects in the sky include the sun, other stars and the moon.</p> <p>The moon is not a source of light. It does not produce light. It reflects the light from the sun.</p> <p>Natural light sources are those which are not made-made. Examples are fire fly; sun, stars</p> <p>Artificial light sources are man-made. They include bulbs; candles; lamps; matches</p> <p>Traffic lights to control traffic</p> <p>Light allows us to see objects around us</p> <p>Indicate when appliance are turned on</p>	<p>Students in groups to predict the three primary colours.</p> <p>Research on internet to find information on primary colours. Lists should be made.</p> <p>Students to make colour wheels of the primary colours and spin to create the secondary colours. Information to be noted.</p> <p>Brainstorming/discussion on rainbows to deduce if students know the colours present and how rainbows are formed.</p> <p>Experiment where students make a rainbow using a glass of water, a flashlight and a sheet of white paper.</p> <p>Tour around school compound to observe colours in nature. This should be followed by class discussion about the role of colours in our lives.</p>	<p>Objective tests</p> <p>A mobile of items which give out light using any available materials. Rubric could include content, creativity and visual impact.</p> <p>Sorting activity – students to classify items as artificial or natural light sources and justify their choices.</p> <p>Essay – “the importance of light in my life”. It may be assessed for volume and accuracy of content.</p> <p>Objective test</p>	<p>Video</p> <p>Paints/markers</p> <p>Card</p> <p>Pictures of light sources</p> <p>Specimens of items which give out light</p>

TOPIC: Energy (Sound)

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Identify sounds in the immediate environment;</p> <p>Generate a variety of sounds;</p> <p>Classify sounds - loud or soft, high or low;</p> <p>Classify sounds as nuisance or useful;</p> <p>Name the organ used for hearing;</p>	<p>Useful sounds are ones which bring as pleasure or protect us from harm. Nuisance sounds have the potential to damage our ears or make us feel uncomfortable.</p> <p>The organ of hearing is the ear. A human has two located on the sides of the head.</p>	<p>Teacher to play a variety of sounds for students to identify the sources. Data can be recorded in a worksheet.</p> <p>Students may be shown pictures of animals and objects for them to imitate the sound made. Efforts may be recorded.</p> <p>Practical activity where sounds are made and the students classify them as loud or soft/ high or low. Students to make inferences/ draw conclusions.</p> <p>Activity where students listen to a variety of sounds and classify them as useless or useful with reasons. Discussion session to consolidate information.</p>	<p>Multimedia presentation related to sounds in the environment. A rubric which includes scope of content, relevance, language and audience appeal should be used.</p> <p>Documentation of the practical activities. Students should be assessed for observation, recording and inferring.</p>	<p>http://www.animalpicturesarchive.com/animal/SOUND/ http://www.christiananswers.net/kids/sounds.html</p> <p>Computer with internet access</p> <p>Musical instruments</p> <p>Transistor radio</p> <p>Tape recorder</p>

TOPIC: Human Body

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>List the names of the internal organs of the human body;</p> <p>Identify organs of the human body on a diagram or model;</p> <p>State one function EACH for the heart, lungs and brain;</p> <p>Discuss the effects on the body if any of the organs is malfunctioning.</p>	<p>Brain – learns/ stores information/ creates memories</p> <p>Lungs – breathes to supply body with oxygen and remove excess carbon dioxide</p> <p>Stomach – digests food</p> <p>Intestines – digest food and absorb digested food;</p> <p>Kidneys – makes urine</p> <p>Bladder – stores urine</p> <p>Heart – pumps blood around the body to ensure that all cell get adequate amounts of oxygen and nutrients</p>	<p>Teacher to start discussion by ascertaining what the students know about their organs. Chart should be used to supplement information provided by students.</p> <p>Students to draw diagram and annotate with names of organs and functions.</p> <p>Students to be divided into groups and given an organ to research to find out effects if injured or malfunctions and how to protect it.</p> <p>Students to prepare charts and oral presentations of their findings to be shared with class</p>	<p>Vocabulary test</p> <p>Objective test</p> <p>Students to make model of the human body with organs.</p> <p>The oral presentations and charts/ other visuals on organ malfunction. A rubric/checklist may be used.</p>	<p>Charts</p> <p>Models</p> <p>Plasticine/modeling clay</p> <p>Drawing paper</p>

TOPIC: Human Body

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Name common pieces of safety equipment;</p> <p>Describe how EACH piece of safety equipment protects the body.</p>	<p>Safety equipment includes: helmets; masks; goggles; boots; seat belts and bullet-proof vests</p> <p>Helmet – worn when biking or on construction sites; protects brain from injury.</p> <p>Masks – prevent toxic substances or germs from entering the body.</p> <p>Goggles – protect the eyes from harmful chemicals or solids pieces of material.</p> <p>Boots – protect the toes/feet from being cut, broken or amputated.</p> <p>Seatbelts – ensure that persons are not ejected from vehicles if an accident occurs.</p> <p>Bullet-proof vest – stop bullets from entering the body and damaging organs which could lead to death.</p>	<p>Brain-storming session on safety equipment. To be followed by research for students to acquire additional information.</p>	<p>Objective test</p> <p>Colouring book, for younger students, showing safety equipment.</p> <p>Booklet/poster/game on safety equipment and protection. A rubric/checklist may be used. Assessment could be based on attractiveness, creativity, accuracy and volume of content; language.</p>	

TOPIC: Forces

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Define a push, pull and twist;</p> <p>Classify forces as a push, pull or twist;</p> <p>Differentiate among a push, pull or twist.</p>	<p>A force is any action which causes an item to change speed, direction or shape.</p> <p>A force can be classified as a push, pull or twist.</p> <p>Push – shoving a wheelbarrow, lawn mower, stroller or broom</p> <p>Pull – dragging a box; towing a vehicle</p> <p>Twist – turning a doorknob</p>	<p>Experiment – students to engage with a number of objects and use the findings to determine if each operates by a push, pull or twist.</p> <p>Class discussion on the forces – push, pull or twist.</p> <p>Research on forces- push, pull and twist</p>	<p>A group of items for students to classify with oral explanation.</p> <p>Pen and paper test</p>	<p>Apparatus</p> <p>Household items</p> <p>Text books</p> <p>Computer with internet access</p>

TOPIC: Solid Waste

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Define the term litter;</p> <p>Classify litter items;</p> <p>List reasons why we should not litter;</p> <p>Discuss appropriate disposal of litter;</p>	<p>Litter is items of garbage or rubbish which are left lying around in an open or public place.</p> <p>Litter is made usually made up of small items such as piece of paper; plastic containers; snack wrappers</p> <p>Litter can be grouped as glass; metal; paper; plastic and paper</p> <p>Litter can provide food for vermin such as mice; rats; cockroaches and flies. It can also be home for mosquitoes. These organisms can cause humans to become ill. Litter can also wash into water ways and block the entrance to wells. This could lead to flooding when there is heavy rainfall.</p> <p>Litter should be sorted and placed in the garbage receptacle.</p>	<p>Students to work in groups, tour school compound and collect litter. They should then fashion a definition for the term and compile list of items.</p> <p>Data from groups to be pooled. Students to compile a frequency table, as well as construct a pictograph.</p> <p>Teacher to initiate discussion on whether littering should be encouraged. Notes to be created using students' responses. Research may be used to provide additional information. Oral presentations may be used.</p>	<p>The assignment that involved definition of litter and the pictograph. Students should be assessed for accuracy of content, accuracy of data, visual impact, axes and title.</p> <p>Data analysis questions</p> <p>Students to produced an infomercial for television on why littering should not be encouraged. The checklist used should include accuracy and volume of information, language, audience appeal and creativity.</p> <p>Debate on why students should keep the school litter free (SS). Language, interaction with audience, dynamism, volume of content, accuracy of information, persuasiveness.</p>	<p>Disposal gloves</p> <p>Garbage bags</p> <p>Computer with internet access</p>

TOPIC: Solid Waste

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Compile a list of actions/rules for keeping the school grounds litter free; define the terms natural and man-made as they relate to litter;</p> <p>Classify litter as natural or man-made;</p> <p>Identify items that can be reused;</p> <p>Describe how the items can be reused.</p>	<p>Natural items – produced by plants and animals. Examples – banana peel; wood; chicken bones; meat</p> <p>Man-made items - created by humans in factories. Examples - plastic bottles and bags;</p> <p>Empty plastic and glass bottles - used for storage or vases; bottle caps – used as counters</p>	<p>Dictionary work to provide definition of the terms. Students to use the information to assist with classifying the litter items collected earlier.</p> <p>Students to work in groups, and using previous knowledge, generate a list of rules/actions that could reduce litter on the school premises. Information to be used to make billboards for display around school.</p> <p>Students to collect objects that would normally be discarded and make items with them. Products to be accompanied by instructions for assembly.</p>	<p>Debate on why students should keep the school litter free (SS). Language, interaction with audience, dynamism, volume of content, accuracy of information, persuasiveness.</p> <p>Write a letter to the Principal discussing how litter at the school may be reduced (LA). Assess format, language, content and creativity.</p> <p>The billboards produced may be assessed for creativity, visual impact, volume of content, accuracy.</p> <p>Written test</p> <p>Product packages to be assessed for content, creativity, practicality and creativity</p>	<p>Disposal gloves</p> <p>Garbage bags</p> <p>Large sheet of card</p> <p>Camcorder</p> <p>Digital camera</p> <p>Camera</p> <p>Internet access</p> <p>Items from garbage</p>

CLASS TWO SYLLABUS DOCUMENT

TOPIC: Data Analysis

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>The pupil should be able to:</p> <p>Collect data whenever possible;</p> <p>Record data;</p> <p>Illustrate data in pictographs;</p> <p>Interpret data;</p> <p>Draw logical conclusions.</p>	<p>Data collection is the gathering of information about a specific topic or theme.</p> <p>Data can be presented in tally charts or table.</p> <p>Data can be represented graphically.</p> <p>Types of graphs are: pictograms, bar charts, pie charts and line graphs.</p> <p>Questions related to the data may be used to assist students with forming conclusions about findings</p>	<p>When the topic lends itself to data collection students should gather data, record it in tally sheets, construct pictographs and analyze the findings.</p> <p>Provide students with data for them to produce pictographs and provide answers to given questions</p> <p>graphs to be provided for students to analyze and then participate in whole class discussion</p>	<p>Data analysis questions.</p> <p>Scenarios for analysis.</p> <p>Practical activities.</p>	<p>Data sheets</p> <p>Apparatus</p> <p>Chemicals</p> <p>Books</p> <p>internet</p>

TOPIC: Skill Development

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>The pupil should be able to:</p> <p>Manipulate apparatus</p> <p>Measure quantities</p> <p>Make predictions</p> <p>Make accurate observations</p> <p>Record observations</p> <p>Report orally and in writing on findings</p>	<p>Science education involves the building of process skills while learning content and interacting with concepts.</p> <p>Skill acquisition and development should be an integral part of every lesson.</p> <p>Science process skills are: observing; recording; reporting; classifying; sequencing; inferring; hypothesizing; measuring; predicting; experimenting; analyzing</p>	<p>Practical activities which require students to manipulate equipment or tools; measure quantities; make observations; predict outcomes and analyze data.</p> <p>Scenarios for students to analyze.</p> <p>Oral and multimedia presentations</p>	<p>Observation of students as they engage in experimenting. Use checklists to ascertain how efficient the student is at manipulating apparatus, measuring.</p> <p>Write up of practical activities to assess accuracy of observations and written reporting.</p> <p>Oral presentations to assess oral skills.</p>	<p>Books</p> <p>Chemical Apparatus</p> <p>internet</p>

TOPIC: Plants				
ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Draw diagrams to demonstrate knowledge of key concepts</p> <p>Classify items using distinctive features</p> <p>Arrange items to complete a sequence</p> <p>Analyze data</p> <p>Draw inferences</p> <p>Develop logical hypotheses</p>	<p>Science education requires students to engage with content while developing skills.</p>	<p>Practical activities which require students to manipulate equipment or tools; measure quantities; make observations; predict outcomes and analyze data.</p>	<p>Observation of students as they engage in experimenting. Use checklists to ascertain how efficient the student is at manipulating apparatus, measuring.</p> <p>Write up of practical activities to assess accuracy of observations and written reporting.</p> <p>Oral presentations to assess oral skills.</p>	<p>Books</p> <p>Chemical Apparatus</p> <p>Internet</p>

TOPIC: Living Things

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>List characteristics of living things (growth; movement; feeding/nutrition, excretion; reproduction; sensitivity)</p> <p>Discuss why reproduction; excretion and sensitivity are important to living things</p> <p>Classify animals as vertebrates and invertebrates</p>	<p>All living things have a set of distinctive characteristics.</p> <p>Vertebrates – animals with hard, endo-skeletons which give the animals a shape and protect the internal organs. Invertebrates – animals with exo-skeletons usually made of chitin.</p>	<p>Provide students with specimens or pictures for students to group and complete a worksheet giving reasons for the choices. Conclude with class discussion.</p> <p>Guided discussion to assist with characteristics of living things. Pictures may be used if students do not exhaust list. Students to work collaboratively and produce charts.</p> <p>Pictures for students to classify with reasons. Class discussion to follow to obtain characteristics of vertebrates and invertebrates.</p>	<p>Scenarios to determine if items are living or non-living. Students to justify answers.</p> <p>Sorting activity with reasons.</p>	<p>Pictures Specimens</p> <p>Video</p> <p>Books</p> <p>Internet</p>

TOPIC: Living Things

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Classify invertebrates as insects and non-insects;</p> <p>Discuss the usefulness of insects;</p> <p>Identify insects which are harmful;</p> <p>Discuss the harmful effects of insects.</p>	<p>Insects – a group of invertebrates with bodies divided into head, thorax and abdomen; six legs on thorax; at least a pair of antennae.</p> <p>Insects help to pollinate flowers to ensure that they form fruits and provide food for humans. They also provide useful substances such as honey (bees).</p> <p>Some insects destroy crops (Locusts) and homes (Termites). Others spread diseases: flies - ; mosquitoes – Dengue fever and yellow fever; cockroaches -</p>	<p>Grouping/ sorting activity for students</p> <p>Think-peer-share to bring students' prior knowledge to the fore.</p> <p>Research on the impact of insects on man's existence.</p>	<p>Activity for students to identify insects from a group of organisms giving reasons.</p> <p>Poster to share information about insects. Assessment could be based on creativity; attractiveness; accuracy and volume of content.</p>	<p>Books</p> <p>Internet</p> <p>Card</p> <p>Markers</p> <p>Printer</p>

TOPIC: Living Things

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Define the term camouflage;</p> <p>State examples of camouflage in the insect world;</p> <p>Explain the importance of camouflage.</p>	<p>Camouflage is the ability of an organism to blend in with its environment to avoid being detected.</p> <p>Camouflage allows organisms to hide so that they may attack prey (their food) or to avoid being eaten by predators. The animal is therefore able to prolong its existence.</p>	<p>Teacher to lead discussion on camouflage by providing pictures or a video as stimulus material. Students to formulate a definition for camouflage and reasons why it is importance.</p>	<p>Students to create a scroll depicting camouflage. Assessment should include accuracy and volume of content, language, creativity and visual impact</p> <p>Pen and paper tests</p>	<p>Pictures</p> <p>Videos</p> <p>Texts</p> <p>Internet access</p>

TOPIC: Living Things (Plants)

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Define the term germination;</p> <p>Identify the requirements of a growing plant;</p> <p>State the importance of each requirement;</p> <p>Describe experiments to ascertain basic requirements of plants.</p>	<p>Germination is the sprouting of the baby plant from the seed.</p> <p>Plants require water; oxygen (air), sunlight and mineral to grow properly.</p> <p>Water – to activate chemicals that promote growth</p> <p>Oxygen – to help with the release of energy from food</p> <p>Sunlight – to act as a fuel for photosynthesis</p> <p>Minerals – to build up important compounds</p>	<p>Students in groups to be given diagrams/pictures of the germination process from them to fashion a working definition of the term. (a tape could also be shown)</p> <p>Pictures of germination for students to sequence, and describe what occurs at each stage.</p> <p>Students to germinate seeds and then set up a number of experiments with the seedlings. One with all the requirements and than one each with a requirement lacking. Students to note observations in a worksheet.</p> <p>Discussion of findings.</p>	<p>Stages of germination for students to sequence.</p> <p>Write-up of a practical activity on requirements for plant growth.</p> <p>Data on the growth of plant (height/number of leaves) under different conditions for students to analyze.</p> <p>Pen and paper test based on plant growth and related experiments.</p>	<p>Video/pictures Seeds</p> <p>Apparatus</p> <p>Books</p> <p>Computer with internet access</p>

TOPIC: Living Things (Animals)

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Classify animals as insects and non-insects;</p> <p>State two characteristics of insects;</p> <p>List the stages in the life cycle of the butterfly;</p> <p>Describe the life cycle of the butterfly.</p> <p>Compare the life cycle of the butterfly with that of the housefly and the frog (non-insect)</p>	<p>Insect are animals which have :their bodies divided into three parts – head, thorax and abdomen; antennae; six legs</p> <p>Egg -- larva (caterpillar) – pupa (Chrysalis) -- adult (butterfly).</p> <p>Egg – maggot (larva) -- housefly (adult)</p> <p>Egg -- tadpole -- frog</p>	<p>Students to be given pictures of insects for them to observe and then generate list of characteristics.</p> <p>Video of a butterfly’s life cycle. Students to make notes of the stages involved and use information to complete a graphic organizer. Oral presentations to follow.</p> <p>Diagram/ video or pictures of life cycle of frog for students to note similarities and differences. Class discussion to follow.</p>	<p>Classification activity. Students to justify answers.</p> <p>Building of model of butterfly life cycle. Assess for use of materials; creativity; accuracy</p> <p>Letter to a friend sharing knowledge about the similarities and difference for two life cycles.</p>	<p>Picture</p> <p>Video</p> <p>Card</p> <p>Discarded materials</p> <p>Specimens</p> <p>Garden</p> <p>Pond</p>

TOPIC: Ecology

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Create food chains made up of three organisms;</p> <p>Define the terms producer and consumer;</p> <p>Classify organisms as producers; consumers; prey and predators;</p>	<p>A food chain is a sequence of organisms reflecting feeding patterns. A producer is any organism which makes its own food. Producers are plants. A consumer is any organism which feeds on others.</p> <p>A predator is any animal which hunts and kills other animals to obtain food.</p> <p>Animals which are hunted are called prey.</p>	<p>Teacher to provide flow charts of food chains for students to create a working definition of the term. Discussion to follow.</p> <p>Students to make flow charts/posters depicting food chains with at least three organisms.</p> <p>Teacher to label the producers and consumers. Students to use the information to write definitions for the terms.</p> <p>Video of animals in their habitats displaying predator-prey relationships. Student to develop working definitions of predator and prey, as well as named examples</p>	<p>Written test on food chains</p> <p>Flow charts using rubric/checklist</p>	<p>Pictures of animals</p> <p>Video tapes</p> <p>Internet access</p> <p>Charts</p> <p>Card</p> <p>Paper</p>

Topic: Human Body

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Label the organs of the human body;</p> <p>State functions of the liver, skin and kidneys;</p>	<p>Brain – learns/ stores information/ creates memories</p> <p>Lungs – breathes to supply body with oxygen and remove excess carbon dioxide</p> <p>Liver – removes toxic substances from the blood</p> <p>Stomach – digests food</p> <p>Intestines – digest food and absorb digested food;</p> <p>Kidneys – makes urine</p> <p>Bladder – stores urine</p> <p>Heart – pumps blood around the body to ensure that all cell get adequate amounts of oxygen and nutrients</p> <p>Skin – protects body from harmful micro-organisms</p>	<p>Teacher to start discussion by ascertaining what the students know about their organs. Chart should be used to supplement information provided by students.</p> <p>Students to draw diagram and annotate with names of organs and functions.</p> <p>Students to be divided into groups and given an organ to research to find out effects if injured or malfunctions and how to protect it.</p> <p>Students to prepare charts and oral presentations of their findings to be shared with class.</p>	<p>Vocabulary test</p> <p>Objective test</p> <p>Students to make model of the human body with organs.</p> <p>The oral presentations and charts/ other visuals on organ functions and malfunction. A rubric/checklist may be used.</p> <p>Brochure for use in a doctors office on the roles of the liver, skin and kidneys in the human body. Assess for accuracy and volume of content; creativity; attractiveness and language.</p>	<p>Charts</p> <p>Models</p> <p>Plasticine/modeling clay</p> <p>Drawing paper</p>

Topic: Human Body

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Label the parts of the skin:</p> <p>List functions of named parts of the skin;</p> <p>Discuss the impact of high temperatures on human beings;</p> <p>Identify ways in which people try to keep cool</p> <p>Describe how the body tries to keep itself cool</p>	<p>Skin is made up of many parts. The epidermis, dermis, fat layer; sweat gland; sweat duct; blood capillaries and hair follicles.</p> <p>Sweat glands produce sweat when body temperature is too high. Sweat duct transports the sweat to the skin's surface. Blood vessels help with dissipation of heat.</p> <p>High temperatures cause the body's core temperature to rise. This can lead to heat stroke which can result in death.</p> <p>Wear light weight and light-coloured clothing; use fans/air-conditioners; visit beach/pool</p> <p>Body – sweats. Evaporation of the sweat uses heat and the body cools; blood vessels in skin move closer to the surface to allow heat to dissipate into atmosphere, thus cooling the body.</p>	<p>Diagram of skin with information for students to read and complete worksheet on parts and function</p> <p>Brainstorming to ascertain students' knowledge on the use of solar energy.</p> <p>Students to work collaboratively and take temperature readings over a period of time. A graph of results should be drawn and reasons for the changes noted.</p> <p>Students to be questioned on their reactions to excess heat and attempts to counteract it. Discussion to be used to create note.</p>	<p>Objective test on parts of the skin and functions.</p> <p>Teaching aid (poster, mobile, fact book etc) on the skin and the role played in maintain body temperature. Audience appeal, visual impact, content, language should be assessed.</p> <p>Data analysis questions on temperature changes.</p> <p>Essay on humans beings and their reaction to extremely high atmospheric temperatures. Assess language, content, impact and creativity.</p>	<p>Pictures</p> <p>Charts</p> <p>Model</p> <p>Books</p> <p>Computer with internet access</p>

TOPIC: Agricultural Science

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Prepare a suitable seed-box, tray or tyre garden for planting;</p> <p>Transplant seedlings;</p> <p>Explain why transplanting is necessary;</p> <p>Cultivate crops;</p> <p>Keep simple records related to crops grown</p>	<p>Transplanting is the transfer of seedlings from the plant nursery to the garden.</p> <p>Transplanting is necessary for plants which germinate from small seeds. Planting of these seeds directly into the garden could result in them being eaten or washed away.</p>	<p>Students to prepare area for planting and give oral explanation.</p> <p>Students to work in small groups and research transplanting. Discussion session to follow.</p> <p>Cultivate a crop grown from seeds from planting to harvest. Records of plant growth should be kept as well as the activities involved in caring for the crop.</p>	<p>Skills displayed in preparing seed box/ garden bed to be assessed using a checklist</p> <p>A – Design a poster to educate young farmers about the correct procedure for transplanting. Assess for volume and accuracy of content, creativity, visual impact.</p> <p>records of the crop grown to be assessed for observations, recording and reporting.</p> <p>Drawings of plants at different stages of growth</p>	<p>PET bottles, vehicle tyres, hand tools, newspaper or magazine clippings</p>

TOPIC: Natural Resources

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Sequence the events of the water cycle;</p> <p>Define evaporation, condensation and precipitation;</p> <p>List ways of conserving water;</p> <p>Discuss the importance of water conservation</p>	<p>Evaporation -- condensation – precipitation – runoff/absorption – transpiration</p> <p>Evaporation – liquid (water) changing into gas (water vapour) Condensation – A gas (water vapour) turning into a liquid (water) Precipitation – the falling of water, in any state, from the sky.</p> <p>Washing car with bucket; placing bottle of water in toilet cistern; turning off tap while brushing teeth.</p>	<p>Guided discussion. Start with the question from where does the rain come? Use student responses to create a flow chart of the water cycle.</p> <p>Students to use dictionary to find meanings of key terms and prepare booklet of terms associated with the water cycle.</p> <p>Experiment using a watch glass with ice over a beaker of hot water to simulate rain formation. Students to make conclusions</p> <p>Show footage of persons wasting water or a combination of wasting and conserving. Students to discuss and list water conservation methods.</p> <p>Essay entitled “ The day the world ran out of water”</p>	<p>The charts of the water cycle. The booklet of terms can be assessed using a rubric which includes accuracy of information, volume of content, visual impact, creativity, language Write up of the practical activity “making rain”</p> <p>Grading of the rain gauges produced. Here the skills of manipulation and measuring can be assessed.</p> <p>Graphs and analysis of rainfall data.</p> <p>List of rainfall conservation methods</p>	<p>Chart of water cycle</p> <p>Apparatus or containers found in the home</p> <p>Empty plastic bottles</p> <p>Internet access</p> <p>Texts</p> <p>Dictionary</p>

TOPIC: Weather

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Identify types of clouds;</p> <p>Discuss the type of weather associated with various clouds;</p> <p>Construct simple instruments for checking wind strength and direction, and measuring rainfall;</p> <p>Use the instruments to measure wind strength, direction and rainfall amounts;</p> <p>Discuss the effect of weather on a person's dress.</p>	<p>Clouds can be: Cumulus – puffy, popcorn like white clouds associated with fair weather Cirrus – thin, wispy, hair-like associated with fair weather Stratus- uniform layer of grayish cloud, usually brings a drizzle Cumulonimbus – clouds with anvil-shaped tops. These clouds are associated with thunder, lightning and heavy rain</p> <p>Wind strength – anemometer Wind direction- wind vane or wind sock Rainfall- rain gauge</p>	<p>Pictures of clouds. Students to research to find names and associated weather. Class discussion.</p> <p>Experiment using a watch glass with ice over a beaker of hot water to simulate rain formation. Students to make conclusions.</p> <p>Students to research how to make a rain gauge and test its efficiency.</p> <p>Students to be given rainfall figures to draw graphs and discuss any patterns.</p> <p>Think-peer-share to generated information about the effect of weather on one's dress.</p>	<p>Matching activity – clouds and their characteristics.</p> <p>Assessment of the weather instruments.</p> <p>Oral presentation on the effect of weather on a person's dress.</p>	<p>Books</p> <p>Pictures</p> <p>Video</p> <p>Internet</p>

TOPIC: Matter

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>The pupil will be able to: State two characteristics of each state of matter;</p> <p>State definitions for the changes of state: melting; freezing; evaporation and condensation;</p>	<p>Liquids – can flow or pour; have no definite shape; take shape of container. Solids – have definite shape; are firm/hard; can break. Gases – can flow or be poured; have no definite shape; take the shape of the entire container; spread out easily.</p> <p>Melting – solid changing to liquid when temperature increases; freezing – liquid changing to solid when temperature is lowered; Evaporation – liquid turning into a gas at a temperature lower than boiling point</p>	<p>Teacher to supply each group with a number of substances to observe and interact with. Students to complete a worksheet which requires them to group the items and give reasons for choices. Discussion to follow where teacher organises the information.</p> <p>Research on states of matter for students to obtain names for the groups, as well as any other relevant information.</p> <p>Game for students to match state of matter with examples and characteristics. Students to write information in books at end of game.</p>	<p>Each group of students to be given a different state of matter to research and then produce a colouring/information book. The teacher should create the appropriate rubric to include volume of content, accuracy, appropriateness of graphics, language, creativity and visual impact</p>	<p>Substances/objects</p> <p>Textbooks</p> <p>Video clips</p> <p>Camcorder/digital camera</p> <p>Computer with internet access</p>

TOPIC: Matter

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Classify changes experienced daily as melting; freezing; evaporation and condensation</p>	<p>Substances change from one state to another depending on the temperature.</p> <p>Melting – ice-cream on a cone; butter in a hot frying pan; a burning candle.</p> <p>Freezing – water in an ice-pan in the freezer;</p> <p>Evaporation – alcohol in an open bottle disappearing</p> <p>Condensation – water forming on a hot saucepan cover when it is removed from the saucepan.</p>	<p>Students to be given picture; shown a video or given scenarios to describe what is taking place. After engaging in dictionary work/research, students will classify the changes of state with reasons.</p> <p>Experiment – students to conduct change of state experiments.</p>	<p>Pen and paper test with listed changes of state for students to classify.</p> <p>An infomercial on changes of state to educate house-wives.</p> <p>Write up of the practical. Assessment should be based on manipulation of equipment; accuracy of observations and conclusions.</p>	<p>Video Picture Paper Card</p>

TOPIC: Energy

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Investigate the passage of light through an assortment of material; classify materials as transparent, opaque and translucent;</p> <p>Compare transparent, opaque and translucent materials;</p> <p>Explain how shadows are formed;</p>	<p>Transparent items allow all of the light to pass through them. Hence, we can see clearly through them. Glass and plastic wrap are examples. Translucent objects allow only some of the light to pass through them. Examples are tinted glass and wax paper. Opaque items do not allow any light to pass through. It is difficult to see through an opaque object. Wood and metal are examples.</p> <p>Shadows are formed when an opaque object blocks the path of light from a light source.</p>	<p>Practical activity using a flash light and a number of materials. Students to note observations and use these to classify the materials. They should also be able to define the terms.</p> <p>Create shadows on a wall and then write an explanation for how shadows are formed.</p> <p>Practical- place a pole on the pasture and measure its shadow every half-hour for a school day. Any other observations should be noted. Students should use the information to describe how shadows vary with time/hour of day.</p>	<p>Documentation of the practical activity. The skills assessed should include classification, recording and inferring.</p> <p>Write up of the practical activity. Observation, reporting and inferring can be assessed.</p>	<p>Flashlight</p> <p>Seedlings</p> <p>Assortment of materials that interact with light in different ways</p> <p>http://www.bbc.co.uk/schools/scienceclips/ages/7_8/light_shadows.shtml</p>

TOPIC: Energy

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Name the organ used for hearing;</p> <p>Discuss the importance of hearing;</p> <p>Name common musical instruments;</p> <p>Describe how each instrument produces sound.</p>	<p>Hearing is one of the senses. It alerts us to stimuli in the environment and serves to protect us from danger.</p> <p>Percussion – drum, triangle Wind- horn; flute; trombone; recorder String – piano; violin; guitar</p> <p>Percussion – when struck the instrument vibrates Wind – air blown into the reed vibrates String - when the strings is plucked it vibrates</p>	<p>Guided discussion to elicit the importance of ears and hearing to human beings. Students to note ways how hearing is beneficial.</p> <p>Students to work in groups to research musical instruments. Discussion session to follow.</p> <p>Experiment to ascertain how sounds are made e.g. tuning fork; rulers.</p> <p>Students to interact with a number of musical instruments and generate ideas about how they produce sound. Discussion to follow.</p>	<p>A poster/ booklet on the value of hearing. Grades should be awarded for volume, accuracy and relevance of content; language, visual impact and creativity.</p> <p>A mobile of musical instruments. Assess for volume and accuracy of information, inclusion of graphics, visual impact and creativity.</p>	<p>Computer with internet access</p> <p>Musical instruments</p> <p>Transistor radio</p> <p>Tape recorder</p>

TOPIC: Forces

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>List uses of magnets;</p> <p>State the material of which magnets are made;</p> <p>Classify materials as magnetic/non-magnetic;</p> <p>Discuss the importance of magnets to man;</p> <p>Plan and design an experiment to measure the strength of a magnet;</p>	<p>A magnet is any substance which attracts items made of iron/steel. Lodestone is a naturally occurring magnet.</p> <p>Magnets are use to sort metallic items and keep the fridge door closed.</p> <p>The stronger the magnetic force the greater is the number of items it can attract.</p>	<p>Students to be shown pictures of situations where man uses magnets. Discussion to follow. List of uses to be generated.</p> <p>Practical activity to test materials in order to classify them as magnetic or non-magnetic</p> <p>Students in small groups to plan an experiment to measure the strength of a magnet. Students to carry out the experiment to ascertain if the method is feasible.</p>	<p>Pen and paper test based on uses of magnets and behave of materials with magnets</p> <p>Documentation of the classification practical</p> <p>Write-up of experiments e.g. Testing the strength of a magnet</p>	<p>Magnets</p> <p>Non-magnetic and magnetic materials</p>

TOPIC: Solid Waste Management

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Define the terms reduce, reuse and recycle;</p> <p>Classify litter as recyclable or non-recyclable;</p> <p>Describe how one of paper, glass or aluminum is recycled;</p> <p>Discuss the importance of recycling as it relates to Barbados.</p>	<p>Solid waste, especially that produced in the home, is problematic in the Caribbean. There is need to address this problem. One way is to reduce; reuse and recycle.</p> <p>Recyclables are made of paper, plastic, aluminum, glass.</p> <p>Limited land space to accommodate garbage. Need to decrease the amount of waste being collected by S.S.A.</p>	<p>Dictionary work for students to find the meaning of the terms as they relate to garbage.</p> <p>Students to collect litter from around school and then group or classify the items as recyclable or non-recyclable.</p> <p>Students to work in small groups and research how paper is recycled. Information to be recorded in a worksheet. Oral presentations to follow.</p> <p>Practical activity to recycle newsprint.</p> <p>Brainstorming session on the need for recycling in Barbados. Students to list reasons.</p>	<p>A fact book on terms associated with litter. Assessment by checklist or rubric which includes level of content, accuracy of content, language, visual impact, audience appeal</p> <p>Write up of the practical. Skills include recording reporting and inferring.</p> <p>Letter to a friend sharing what was learned about recycling paper. Assess content, audience appeal and language</p> <p>Documentation of the experiment on recycling paper. Skills to be assessed - manipulation, observation and reporting.</p> <p>A “How to book” on recycling paper. Creativity, language</p>	<p>Items of litter</p> <p>Textbooks</p> <p>Internet access</p>

CLASS THREE
SYLLABUS
DOCUMENT

TOPIC: Data Collection and Analysis				
ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Collect data where appropriate;</p> <p>Record data;</p> <p>Illustrate data in bar charts, and pie charts;</p> <p>Interpret data;</p> <p>Make inferences and conclusions from given data.</p>	<p>Data collection is the gathering of information about a specific topic or theme.</p> <p>Data can be presented in tally charts or table.</p> <p>Data can be represented graphically.</p> <p>Types of graphs are: pictograms, bar charts, pie charts and line graphs.</p> <p>Questions related to the data may be used to assist students with forming conclusions about findings</p>	<p>When the topic lends itself to data collection students should gather data, record it in tally sheets, construct pictographs and analyze the findings.</p> <p>Provide students with data for them to produce pictographs and provide answers to given questions</p> <p>Graphs to be provided for students to analyze and then participate in whole class discussion</p>	<p>Data analysis questions.</p> <p>Scenarios for analysis.</p> <p>Practical activities.</p>	<p>Data sheets</p> <p>Apparatus</p> <p>Chemicals</p> <p>Books</p> <p>Internet</p>

TOPIC: Skill Development

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>The pupil should be able to:</p> <p>Manipulate apparatus</p> <p>Measure quantities</p> <p>Make predictions</p> <p>Make accurate observations</p> <p>Record observations</p> <p>Report orally and in writing on findings</p>	<p>Science education involves the building of process skills while learning content and interacting with concepts.</p> <p>Skill acquisition and development should be an integral part of every lesson.</p> <p>Science process skills are: observing; recording; reporting; classifying; sequencing; inferring; hypothesizing; measuring; predicting; experimenting; analyzing.</p>	<p>Practical activities which require students to manipulate equipment or tools; measure quantities; make observations; predict outcomes and analyze data.</p> <p>Scenarios for students to analyze.</p> <p>Oral and multimedia presentations</p>	<p>Observation of students as they engage in experimenting. Use checklists to ascertain how efficient the student is at manipulating apparatus, measuring.</p> <p>Write up of practical activities to assess accuracy of observations and written reporting.</p> <p>Oral presentations to assess oral skills.</p>	<p>Books</p> <p>Chemical Apparatus</p> <p>Internet</p>

TOPIC: Skill Development

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Draw diagrams to demonstrate knowledge of key concepts</p> <p>Classify items using distinctive features</p> <p>Arrange items to complete a sequence</p> <p>Analyze data</p> <p>Draw inferences</p> <p>Develop logical hypotheses</p>	<p>Science education should involve development of skills as well as understanding of concepts/content.</p> <p>Skill acquisition and development should be an integral part of every lesson.</p> <p>Science process skills are: observing; recording; reporting; classifying; sequencing; inferring; hypothesizing; measuring; predicting; experimenting; analyzing.</p>	<p>Drawing of biological specimens.</p> <p>Activities which involve sequencing of events or items and classifying.</p> <p>Scenarios; data or experiments which require analysis of information and the development of inferences.</p>	<p>Any activities which promote the development of the process skills.</p>	<p>Books</p> <p>Chemical Apparatus</p> <p>Internet</p>

TOPIC: Living Things

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Discuss why animals are classified as living things; Define the terms vertebrate and invertebrate; Classify organisms as vertebrates or invertebrates; Cite examples of vertebrates and invertebrates; Classify vertebrates as amphibian, reptiles, birds, fish or mammals; State at least two characteristics for EACH group of vertebrate</p>	<p>Characteristics of living things – respire; reproduce; move; grow; feed; excrete and sensitivity.</p> <p>Vertebrates have backbones while invertebrates do not. Invertebrates – butterfly, spider, slug, snail, centipede. Vertebrates – human, dog, dove, frog, snake</p> <p>Vertebrates - Birds have feathers, beaks and wings; are warm-blooded; Fish – covered with scales, have gills; are cold-blooded; Amphibians – cold-blooded, spend part of life cycle in water and part on land; Reptiles – scaly skin; cold blooded Mammals – covered with hair/fur; suckle their young</p>	<p>Brainstorming to ascertain unique characteristics of animals.</p> <p>Students to work collaboratively to group pictures of animals. Teacher to question students about their choices. Teacher to note students’ responses and create note.</p> <p>Teacher to set up information stations around class. Students to source any information they lack. Students to complete work sheets on classes of vertebrates.</p> <p>Students to produce flow charts/ concept map, with pictures, showing classification of animals</p> <p>A matching activity involving pairing of animals with characteristics</p>	<p>Research project on one vertebrate group. A booklet and oral presentation. Rubric should assess content, language, creativity, visual impact, audience appeal.</p> <p>Written test include graphics for observation. Higher order questions should also be used.</p> <p>A game to assist with retention of information on vertebrates. A rubric/ checklist to be used. Criteria should include relevance, appeal, content and creativity.</p> <p>Poster/ chart compiled to highlight characteristics and examples of animals. A rubric or checklist may be used. Content and creativity should be assessed.</p>	<p>Pictures/ video Computer Internet access</p>

TOPIC: Ecology

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>List items for which animals depend on plants ;</p> <p>Define the term photosynthesis;</p> <p>Recall what food chains are:</p> <p>Construct a food web;</p> <p>Identify food chains present in a food web;</p> <p>Discuss the impact of removing any named organism from the food web.</p>	<p>Animals depend on plants for food oxygen and even shelter</p> <p>Photosynthesis – the making of food by green plants using the sun’s energy, water and carbon dioxide.</p> <p>Food chain – A list of organisms showing feeding relationships.</p> <p>A food web is a network of interconnected food chains.</p> <p>Removal of an organism could lead to decrease food for some organisms and an over abundance of some organisms.</p>	<p>Students to work in groups to identify food chains from given food webs.</p> <p>In groups students to brainstorm about the impact of removing named organisms from a food web. Class discussion to follow.</p>	<p>Students to create food webs from given food chains.</p> <p>Partial food webs for students to complete</p> <p>Pen and paper tests</p> <p>Game to assist persons with understanding food webs</p> <p>Letter to a neighbor to inform them about food webs.</p>	<p>Pictures</p> <p>Computer</p> <p>Internet</p>

TOPIC: Living Things

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Explain why plants are classified as living things;</p> <p>Classifying plants as trees, herbs, vines and shrubs;</p> <p>List the characteristics of trees; herbs; vines and shrubs;</p> <p>Discuss the usefulness of trees, herbs; vines and shrubs to man;</p>	<p>A tree has a single, erect, woody, stem called a trunk which is at least three inches in diameter. They are taller than 4 metres and have a definite crown of foliage at least 1.5 metres above the ground.</p> <p>Shrubs: are shorter than trees; have many permanent stems of less than 3 inches in diameter which originate at a base.</p> <p>Herbs –Usually short with soft, green stems which contain no wood. Banana is the largest herb.</p> <p>Vines – soft, woody stem; grows by creeping, climbing and twisting on other structures</p> <p>Plants provide food; raw materials; shelter and medicines.</p>	<p>Pictures of plants for them to observe and list characteristics that make them living things</p> <p>Students to research trees, herbs and shrubs and list the characteristics of each. Discussion to follow.</p> <p>Nature walk for students to name plants and classify them as trees, herbs or shrubs. Information to be recorded in a table or a graphic organizer.</p> <p>Brainstorming to ascertain students’ prior knowledge about usefulness of plants. Research to follow. Completion of graphic organizer.</p>	<p>Classification chart showing examples and characteristics of trees, herbs and shrubs. The assessment tool should include content, language, use of graphics and visual impact.</p> <p>Objective tests e.g. fill-in the blanks, multiple choice, true and false, matching.</p> <p>A letter to a friend sharing what was learnt about plant propagation. Assess format, language, content, accuracy.</p> <p>Mobile highlighting information about trees, herbs, shrubs and vines.</p> <p>Poster – usefulness of trees, herbs, shrubs and vines to man.</p>	<p>Pictures</p> <p>Charts</p> <p>Local flowers, fruits</p> <p>The school garden</p> <p>Specimens</p>

TOPIC: Living Things

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Discuss the importance of flowers in the life cycle of a plant;</p> <p>Identify the parts of the flower;</p> <p>State the functions of the parts of the flower;</p> <p>Discuss the importance of fruit formation.</p>	<p>Flowers develop into fruits when they are pollinated and fertilization occurs. The fruits contain seeds which germinate to produce more plants.</p> <p>Flower parts – Stalk –attaches flower to plant Sepals – protect the immature flower (bud) Petals – attract animals to flower Stamen – male part of flower – contain the pollen Pistil –female part of flower –contains ovules which develop into seeds.</p> <p>Fruits develop to protect the seeds which they contain to ensure that plant can increase its population.</p>	<p>Teacher to supply pictures of plant parts used to generate new plants. Students to complete a worksheet. Guided discussion session to follow.</p> <p>Students to collect flowers, observe the specimens and list common characteristics. Dissect flower, draw the various parts, label and state their functions.</p> <p>Use computer simulation to show stages in the development of fruits. Students to record the changes occurring. Oral presentations should close the unit.</p>	<p>A letter to a friend sharing what was learnt about plant propagation. Assess format, language, content, accuracy.</p> <p>Practical activity – each group of students to propagate a plant using one of the methods (seeds, suckers, cuttings). Assess observation, recording, reporting and inferring.</p> <p>Students to draw a typical flower, label the parts and annotate. Skills to be assessed drawing and reporting. Activity to sequence the stages in fruit development and describe the process</p>	<p>Local flowers, Fruits Alcohol Containers for collecting materials Computer with internet access</p> <p>http://www.kidsgardening.com/2005.kids.garden.news/april/pg1.html</p>

TOPIC: The Human Body

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>List the nutrients found in foods;</p> <p>Identify the main nutrient in given foods;</p> <p>Classify foods as grow, glow and go foods;</p> <p>Discuss the importance of various food types to the body;</p> <p>Evaluate the nutritional nature of different meals.</p> <p>Identify organs which contribute to the digestion of food substances.</p>	<p>Protein, fats, carbohydrates, minerals and vitamins</p> <p>Grow foods are rich in protein (fish/meat/ beans). Needed for building muscle or repairing body tissue. Glow food enhance the quality of the skin and are rich in vitamins and minerals (fruits)</p> <p>Go foods provide energy to carry out all activities. These are rich in carbohydrates (bread, cereal)</p> <p>The tongue, stomach, intestine, liver</p>	<p>In small groups read food labels to generate a list of nutrients present. Discussion of quantities present in the food.</p> <p>Research the nutrients and determine which should be classified as grow, glow and go giving reasons. Discussion to follow.</p> <p>Brainstorming session to elicit knowledge of effects on deficiencies and surpluses. Pictures of persons may also be used as stimulus material.</p> <p>Menus/ trays with food items for student to discuss their nutritive value, and effects on the eaters.</p>	<p>Written tests Food items/ pictures to be classified. Assessment accuracy.</p> <p>Booklet for a doctor's office providing information on food nutrients and their importance. Assess for impact, creativity and content,</p> <p>Scenarios for students to analyze.</p> <p>Matching of given meals with specified individuals. Reasons for choices to be included. Assessment to be based on accuracy of content and inferring.</p>	<p>Pictures Charts Stories/ photos of persons who are malnourished.</p> <p>Worksheets</p> <p>Card</p> <p>Paper</p> <p>Computer with internet access and printer.</p>

TOPIC: Agricultural Science

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Discuss the importance of agriculture in Barbados;</p> <p>List three examples of livestock reared in the Caribbean region;</p> <p>Define the term poultry;</p> <p>Identify the three types of poultry;</p>	<p>Agriculture provides jobs and foreign exchange</p> <p>Cattle; sheep; goats and pigs</p> <p>Poultry – feathered animals reared to provide food for human beings.</p> <p>Poultry can be layers (egg producer); broilers (meat producers) and dual-purpose (meat and egg producers)</p>	<p>Brainstorming/ guided discussion to find out students’ knowledge about agriculture in Barbados</p> <p>Use the internet to research one crop and one animal used in agriculture in a country other than Barbados</p> <p>Students to use dictionary to find the meaning of the term poultry and then list names of poultry.</p>	<p>An article for the newspaper indicating the importance of agriculture to Barbados. Assessment should cover language, appeal and content. Locating crops and livestock found throughout the Caribbean on a map of the Caribbean. (S.S)</p>	<p>Pictures/videos of local crops and livestock</p> <p>Life specimens of crops and animals</p> <p>Crops and animals on the farm</p>

TOPIC: Agricultural Science

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
Name poultry used for food;	Chicken, duck, turkey	Research to ascertain types of poultry. Class discussion to follow.	Poster on poultry and the importance to agriculture. Rubric used should cover visual impact, creativity, language, content and accuracy of information. Written tests	Poultry Farm Personnel at the farm
List important steps involved in the rearing chickens	Preparing incubator; feeding; watering; debeaking; vaccinating; changing litter; slaughtering	Visit to a farm to observe how poultry is reared. Students to document information in a task sheet.	Oral presentation on “A visit to a farm.” Assess students on diction, eye contact, appeal, language and content.	

Topic: Resources

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Define the terms soluble and insoluble;</p> <p>Classified substances as soluble/insoluble in water;</p> <p>Outline experiments to ascertain whether substances are soluble or insoluble;</p> <p>State the factors that affect rate of dissolving of solids;</p>	<p>Soluble substances dissolve in solvents like water. Insoluble substances do not dissolve in solvents Soluble – salt, sugar, Kool-aid Insoluble – sand, chalk</p> <p>Add substance to a measured amount of water and stir. Note observations.</p> <p>Factors which affect dissolving are: temperature of solvent; size of particles of the solute and degree of stirring.</p>	<p>Experiment adding different substances to water and noting observations. Students to classify items based on whether they dissolve or not.</p> <p>Students to use dictionaries to find the meaning of soluble and insoluble. This knowledge should be used to classify substances.</p> <p>Experiment to ascertain factors which affect the rate at which solids dissolve.</p>	<p>Write-up of practical activity on dissolving. Skills assessed can be manipulation, Observation. recording, reporting.</p> <p>Objective tests</p> <p>Write up of the laboratory investigations. Assess skills such as manipulation, measurement, observation, recording and reporting and inferring</p>	<p>Heat source Ice Variety of solutes Thermometer apparatus</p>

Topic: Natural Resources

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Relate rate of dissolving to food preparation;</p> <p>Investigate factors that influence the rate of evaporation of water;</p> <p>List the factors that affect rate of evaporation of water;</p> <p>Apply knowledge of rate of evaporation to drying of laundry and other household chores.</p>	<p>The rate of evaporation of a liquid is affected by the temperature; wind speed and the area of item exposed.</p> <p>Clothes dry faster on hot, dry, sunny days as opposed to wet/humid ones. Clothes which are folded take longer to dry.</p>	<p>Conduct experiments to ascertain factors that affect rate of evaporation e.g. temperature and presence of wind.</p> <p>Scenarios for students to analyze and provide content to support their opinions.</p>	<p>Objective tests</p> <p>Write up of the laboratory investigations. Assess skills such as manipulation, measurement, observation, recording and reporting and inferring</p>	<p>Thermometer</p> <p>Apparatus</p>

Topic: Natural Resources

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Define the term atmosphere;</p> <p>List characteristics of air;</p> <p>Discuss the importance of air to man;</p> <p>Name two pollutants of air;</p> <p>Discuss the harmful effects of common air pollutants;</p>	<p>Atmosphere – the collection of gases which surrounds the earth.</p> <p>Air is colourless and odourless.</p> <p>Air is important to sustain life. It allows human to obtain energy from food.</p> <p>A pollutant is any substance which contaminates the environment. Air pollutants are smoke; carbon monoxide; nitrogen dioxide Smoke – respiratory problems; Asthma. Carbon monoxide – death Nitrogen dioxide – respiratory distress</p>	<p>Students to research the topic of air and collect information on characteristics and importance. Discussion session to follow.</p> <p>Students to be shown footage of sources of pollution for them to list the pollutants and their effects.</p>	<p>Students to create a scroll depicting camouflage. Assessment should include accuracy and volume of content, language, creativity and visual impact.</p> <p>Pen and paper tests</p> <p>Fact book on the properties of air, as well as pollution. The assessment tool should address accuracy of content, volume of content, language, audience appeal, visual impact, creativity.</p>	<p>Video/ film</p> <p>Books</p> <p>Computer</p>

Topic: Matter

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>The pupil will be able to: Describe the arrangement of particles in the three states of matter;</p> <p>Account for the properties of the different states based on arrangement of particles;</p>	<p>In a solid the particles are closely-packed, in a regular pattern. This results in solids being firm/hard; having a regular shape</p> <p>Particles in liquids are moderately spaced or loosely packed. This results in liquids having the ability to flow or be poured, as well as not having a definite shape but taking the shape of the part of the container.</p> <p>In a gas, particles are widely-spaced. Hence gases have no definite shape; can flow or be poured; spread out easily and therefore take the shape of the entire container.</p>	<p>Pictures/ models of the arrangement of particles in the three states for students to note observations.</p> <p>Research to ascertain how the arrangement of particles influences the properties of substances. Can be followed by a class discussion.</p> <p>Each student to choose a substance and share information regarding particle arrangement and properties.</p>	<p>Students to create models showing particle arrangement in named substances using materials around the home.</p> <p>Pen and paper test – matching of characteristics with state of matter.</p> <p>Booklet to share information on states of matter and their properties.</p>	<p>Books Models</p> <p>Pictures Computer with internet access</p>

Topic: Matter

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Define the terms solidification and sublimation;</p> <p>Cite examples of solidification and sublimation;</p> <p>Discuss the usefulness of sublimation and freezing;</p> <p>Discuss a hazard of solidification/freezing</p>	<p>Solidification is the changing of a liquid to a solid. Examples – butter becoming hard</p> <p>Sublimation is the change of state from solid to gas. E.g. Solid air-fresheners and moth-balls.</p> <p>Sublimation allows us to keep our homes and clothes smelling fresh.</p> <p>Freezing provides ice to cool our bodies on hot days and preserve food for long periods of time.</p> <p>Freezing of water in pipes can cause them to rupture and disrupt water delivery to homes.</p>	<p>Experiments for students to experience sublimation and solidification, and generate working definitions.</p> <p>Research to find out how the two processes are useful or hazardous.</p>	<p>A list of changes of state for students to classify.</p> <p>Pamphlet on the sublimation and solidification. Assess for accuracy or volume of content; attractiveness; creativity; language.</p>	<p>Apparatus</p> <p>Chemicals</p> <p>Books</p> <p>Internet</p>

Topic: Weather				
ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Describe how rain is formed;</p> <p>Monitor rainfall pattern;</p> <p>Analyze rainfall data;</p> <p>Measure and record temperature in a particular location over a period of time;</p> <p>Explain changes in temperature over a period of time;</p>	<p>Rain forms when water vapour in the atmosphere rises and eventually cools thus changing into water droplets. The water droplets aggregate (join). When they become too heavy they fall to the earth as rain.</p> <p>Temperature is measure with a thermometer in degrees Celsius or Fahrenheit.</p> <p>Atmospheric temperatures increase from morning to evening and then decrease as the sun sets.</p>	<p>Video/ written account of how rain forms for students to review and make notes.</p> <p>Activities for students to analyze data.</p> <p>Experiment – Noting the temperature every hour over a twelve-hour period. Discussion of results.</p>	<p>Data analysis questions on rainfall and temperature.</p>	<p>Video</p> <p>Thermometers</p> <p>Books</p> <p>Internet</p>

Topic: Energy

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>List ways in which solar energy is used;</p> <p>Discuss the importance of solar energy to man</p> <p>Discuss the impact of solar energy on man</p>	<p>Solar energy - energy generated by the sun.</p> <p>Solar energy is useful. Man uses it: dry clothes; dry food items; power calculators; cook food; produce electricity.</p> <p>Solar energy causes man to sweat which can lead to dehydration. If rehydration does not occur one can suffer from heat stroke. Prolong exposure to sunlight could also result in skin cancer.</p>	<p>Brainstorming to ascertain students' knowledge on the use of solar energy.</p> <p>Show and tell – students to bring items/pictures of items which operate by harnessing the sun energy.</p> <p>Research on the effects of solar energy on man's body.</p>	<p>Oral/ multimedia presentation on the importance of solar energy. Assess for fluency, eye contact, volume and accuracy of content</p> <p>A brochure on the importance of protecting one's self from the sun's rays. Assess attractiveness, creativity, volume and accuracy of content.</p>	<p>Pictures</p> <p>Charts</p> <p>Model</p> <p>Books</p> <p>Computer with internet access</p>

Topic: Energy

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Label parts of the skin</p> <p>List functions of the parts of the skin</p> <p>Discuss the impact of high temperatures on human beings;</p> <p>Identify ways in which people try to keep cool the body tries to keep itself cool.</p>	<p>Skin is made up of many parts. The epidermis, dermis, fat layer; sweat gland; sweat duct; blood capillaries and hair follicles.</p> <p>Sweat glands produce sweat when body temperature is too high. Sweat duct transports the sweat to the skin's surface. Blood vessels help with dissipation of heat.</p> <p>High temperatures cause the body's core temperature to rise. This can lead to heat stroke which can result in death.</p> <p>Wear light weight and light-coloured clothing; use fans/air-conditioners; visit beach/pool</p> <p>Body – sweats; blood vessels in skin move closer to the surface to allow heat to dissipate into atmosphere</p>	<p>Brainstorming to ascertain students' knowledge on the use of solar energy.</p> <p>Students to work collaboratively and take temperature readings over a period of time. A graph of results should be drawn and reasons for the changes noted.</p> <p>Students to be questioned on their reactions to excess heat and attempts to counteract it. Discussion to be used to create note.</p> <p>Diagram of skin with information for students to read and complete worksheet on parts and function.</p>	<p>Data analysis questions on temperature changes.</p> <p>Essay on humans beings and their reaction to extremely high atmospheric temperatures. Assess language, content, impact and creativity.</p> <p>Objective test on parts of the skin and functions.</p> <p>Teaching aid (poster, mobile, fact book etc) on the skin and the role played in maintain body temperature. Audience appeal, visual impact, content, language should be assessed.</p>	<p>Pictures</p> <p>Charts</p> <p>Model</p> <p>Books</p> <p>Computer with internet access</p>

Topic: Forces (Magnetism)

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Construct an electromagnet;</p> <p>Identify items which contain electromagnets</p> <p>State one difference between magnets and electromagnets.</p>	<p>An electro magnet is any object which becomes magnetic when an electric current flows through it.</p> <p>Radios; computer monitors; speakers and televisions contain electromagnets.</p> <p>The magnetism of an electromagnet is temporary. Magnets have sustained magnetism. Electricity is necessary for an electromagnet to function.</p>	<p>Research to find out how to make an electromagnet. Students to design, construct and test an electromagnet.</p> <p>Research to gather information on common items which utilize electromagnets</p> <p>Research to ascertain the differences between magnets and electromagnets. Experiments to ascertain how magnets and electromagnets are similar and different.</p>	<p>Grading of the electromagnet based on esthetics; manipulation of apparatus and functionality.</p> <p>Poster to provide younger children with knowledge about magnets and electromagnets. Assess for attractiveness; creativity; accuracy and volume of content.</p>	<p>Books</p> <p>Computer with internet connectivity.</p>

Topic: Solid Waste

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Define the term bio-degradable;</p> <p>Classify garbage as biodegradable or non-bio-degradable;</p> <p>Discuss why composting is a practice that should be encouraged;</p> <p>Describe how a compost heap is established</p> <p>Construct a compost heap as a strategy for waste disposal</p>	<p>Biodegradable – can be destroyed or broken down by micro-organisms Biodegradable – plant and animal products; special plastics. Non-biodegradable – metals; most plastics</p> <p>Composting – natural process which changes organic material into a rich, dark substance. It reduces the amount of solid waste going to landfill and produces fertilizer for the garden</p>	<p>Students to be walk around school and note items of litter. Data should be displayed in a line graph and bar chart.</p> <p>Data should be classified as biodegradable/ non-biodegradable. Students to seek meaning to terms and check if items were classified correctly. Discussion to follow.</p> <p>In small groups, students to research composting and present findings orally. Teacher to compile simple note based on student responses.</p> <p>A “how to book on composting” where students document their findings.</p> <p>Making of a compost heap using scraps from school meals offerings</p>	<p>Written tests including data analysis questions on litter.</p> <p>Brochure on why persons should compost. Assessment tool used should include content, accuracy of information and appeal.</p>	<p>Disposable gloves</p> <p>Garbage cans or suitable containers to sort waste</p> <p>Garden tools</p>

CLASS FOUR SYLLABUS DOCUMENT

Topic: Data Collection

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>The pupil should be able to:</p> <p>Collect data where appropriate;</p> <p>Record data;</p> <p>Illustrate data in bar charts and pie charts;</p> <p>Interpret said data;</p> <p>Make inferences and conclusions from given data</p>	<p>Data collection is the gathering of information about a specific topic or theme.</p> <p>Data can be presented in tally charts or table.</p> <p>Data can be represented graphically.</p> <p>Types of graphs are: pictograms, bar charts, pie charts and line graphs.</p> <p>Questions related to the data may be used to assist students with forming conclusions about findings</p>	<p>When the topic lends itself to data collection students should gather data, record it in tally sheets, construct pictographs and analyze the findings.</p> <p>Provide students with data for them to produce pictographs and provide answers to given questions</p> <p>graphs to be provided for students to analyze and then participate in whole class discussion</p>	<p>Projects involving data collection, recording and analysis. Assessment should include accuracy of the data collected, accuracy of pictograph and the inferences formed.</p> <p>Students can be questioned, on an individual basis, about various sets of data.</p> <p>Data analysis questions for students to interact with the data and write their responses</p>	<p>Paper</p> <p>Computer with internet access</p> <p>Crayons</p>

Topic: Skill Development

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>The pupil should be able to:</p> <p>Manipulate apparatus;</p> <p>Measure quantities;</p> <p>Make predictions;</p> <p>Make accurate observations;</p> <p>Record observations;</p> <p>Report orally and in writing on findings;</p> <p>Draw diagrams to demonstrate knowledge of key concepts;</p>	<p>Science education involves the building of process skills while learning content and interacting with concepts.</p> <p>Skill acquisition and development should be an integral part of every lesson.</p> <p>Science process skills are: observing; recording; reporting; classifying; sequencing; inferring; hypothesizing; measuring; predicting; experimenting; analyzing</p>	<p>Practical activities which require students to manipulate equipment or tools; measure quantities; make observations and predict outcomes.</p>	<p>Observation of students as they engage in experimenting. Use checklists to ascertain how efficient the student is at manipulating apparatus, measuring.</p> <p>Write up of practical activities to assess accuracy of observations and written reporting.</p> <p>Oral presentations to assess oral skills.</p>	<p>Books</p> <p>Chemical</p> <p>Apparatus</p> <p>Internet</p>

Topic: Skill Development				
ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
Classify items using distinctive features Arrange items to complete a sequence Analyze data Draw inferences Develop logical hypotheses	Science education should involve development of skills as well as understanding of concepts/content.	Drawing of biological specimens. Activities which involve sequencing of events or items and classifying. Scenarios; data or experiments which require analysis of information and the development of inferences.	Any activities which promote the development of the process skills.	Books Chemical Apparatus Internet

Topic: Living Things (Plants)				
ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>List common plant adaptations;</p> <p>Discuss how adaptations assist plant survival;</p> <p>State ways how plants are propagated;</p> <p>Classify crops according to method of propagation;</p> <p>Discuss the advantages of propagating plants without using seeds;</p> <p>Monitor the growth of a plant (crop);</p>	<p>Plant adaptations are long roots; shallow root systems, swollen stems; small leaves; drip tips on leaves</p> <p>Plants are propagated from seeds, cuttings; suckers; budding and grafting</p> <p>Large numbers of plants can be acquired quickly. All of the plants will have the same characteristics.</p>	<p>Brainstorming session to provide stimulus for the topic.</p> <p>Students to conduct research on plant adaptation and make notes. Discussion session to follow.</p> <p>Teacher to provide pictures or specimens of plant material used for propagation. Students to list ways of propagating plants.</p> <p>Students to work in groups to compare propagation from seeds as oppose to other plant material. Discussion session to follow.</p> <p>Students to cultivate a crop and record all observations and activities conducted,</p>	<p>Students to create a poster or fact book on Plant adaptations. Assess for language, creativity, visual impact, volume and accuracy of content.</p> <p>Objective test</p> <p>Records of the practical activity to be assessed for observations, recording and reporting.</p>	<p>Encyclopedia</p> <p>Text book</p> <p>Computer with internet access</p> <p>Seeds and other plant material</p> <p>Graph paper</p>

Topic: Living Things

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Record information related to plant growth;</p> <p>Describe plant growth for named crops (plants);</p> <p>Plot graphs to represent plant growth patterns.</p>	<p>Height of plant and number of leaves may be used as indicators of growth.</p> <p>Height/number of leaves versus days of growth could be the variables on the graph.</p>	<p>Students to measure height of a plant and count number of leaves over a period of time. Students to use information to draw graphs.</p> <p>A discussion to be written explaining the growth of the plant, Practical to written up using scientific format.</p> <p>Students to collect data on plant growth and draw graphs to represent said data.</p>	<p>The experiment should be assessed for observation, drawing of graph and analysis/ interpretation of the data.</p> <p>A video of plant development in a named crop could be used for assessment.</p> <p>Drawing of graphs from given raw data and analysis of the data.</p>	<p>Seeds and other plant material</p> <p>Graph paper</p>

Topic: Matter

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Use knowledge of states of matter to account for the uses to which common items are put;</p> <p>Classify changes of state;</p> <p>Describe changes of state based on particle arrangement.</p>	<p>Solids – used for building items/containers; Liquids – for drinking; leisure and cleaning; gases – for filling items which need to be flexible.</p> <p>The changes of state are: evaporation/boiling; condensation; freezing; melting; sublimation.</p> <p>When solids are heated the particles vibrate until they break apart and move away from each other. This results in a liquid being formed.</p> <p>A liquid changes into a gas because the moderately spaced particles gain enough energy to move around rapidly and eventually they “jump” out of the liquid.</p>	<p>Students to be given set of items to complete table – use and properties which support the use. Discussion to follow.</p> <p>List of examples of changes of state for students to group with reasons. Research via the internet to provide theory.</p> <p>Video of changes of state showing movement of particles. Students to make notes and then share with elbow buddy. Group discussion to follow.</p>	<p>Oral presentation on the properties of materials which support the uses to which they are put.</p> <p>Pen and paper test.</p> <p>Game to assist younger students with retaining knowledge about changes of state.</p> <p>Role-play of movement of particles when substances change state.</p>	<p>Models</p> <p>Videos</p> <p>Books</p> <p>Internet</p>

Topic: Ecology

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Describe a coral reef;</p> <p>List reasons why a coral reef is a habitat or ecosystem</p> <p>Identify organisms that inhabit coral reefs;</p> <p>Discuss the importance of coral reefs in the Caribbean;</p> <p>Discuss how human beings contribute to coral reef destruction;</p>	<p>A coral reef is a large, calcium carbonate structure made by the secretion</p> <p>Coral reef is a habitat because of the diverse nature. It is home to many species of animals because it offers protect and available food</p> <p>Organisms found in coral reefs include: jellyfish; sea turtle; clams; oysters; eels; fish; sea slugs and octopuses.</p> <p>Coral reefs: protect the coastline from giant waves and potential erosion; serve as source of income for some fisher folk.</p> <p>Coral reefs are being destroyed by: anchors from ships; blast fishing; silt and sand runoff from construction along coastlines; pesticides, fertilizers and detergents washing into the sea.</p>	<p>Discussion/Brainstorming to find out students' level of knowledge about coral reefs. Teacher to show video of a coral reef for students to write a description of the coral reef and organisms present.</p> <p>Students to be given a map of the Caribbean for them to shade the regions where coral reefs are located (SS)</p> <p>Students to work in groups and make a 3-D representation of a Coral Reef using discarded materials (VA)</p> <p>Students to research coral reefs and note how they are important and how man is a threat to these structures.</p>	<p>Students' poster on What really is a coral reef. It should be assessed for content, accuracy</p> <p>Model of Coral Reef to be assess for creativity/ ingenuity, authenticity, accuracy and detail.</p> <p>Written report on the importance of coral reefs to be assessed for creativity, language, content and accuracy of information</p> <p>True/False exercise on the do's and don't as it relates to coral reefs.</p>	<p>Pictures of coral reefs</p> <p>Video tapes of coral reefs</p> <p>"People and Corals – an education pack for Caribbean Schools"</p> <p>http://www.uvi.edu/coral.reefer/</p> <p>http://www.geocities.com/RainForest/2298/</p> <p>http://www.enchantlearning.com/biomes/coralreef/coverpage.shtml</p> <p>http://www.coralfilm.com/fun.html#who</p>

Topic: The Human Body

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Label a diagram of the heart (chambers and blood vessels);</p> <p>Describe how the heart beats;</p> <p>Describe the effect of exercise on heart beat;</p> <p>Explain why this effect is manifested;</p>	<p>The heart is a four-chambered organ. The two upper chambers are atria and the lower two are ventricles. The chambers are separated by valves.</p> <p>The atria fill up, while the ventricles are contracted. The atria then contract and force the blood into the ventricles. The ventricles contract to force the blood from the heart while the atria fill up.</p> <p>Exercise causes heart rate to speed up.</p> <p>The heart speeds up during exercise to provide oxygen- rich blood to the cells of the body.</p>	<p>Teacher to display a diagram/model of the human torso for students to state where the heart is located.</p> <p>Students to work in groups with diagrams or models of the heart to generate a description.</p> <p>Discussion and note taking session to follow.</p> <p>Students to work in pairs and measure their pulse rates at rest. They should then exercise for 3 minutes and retake the pulse rate. Observations and data to be recorded. Class data to be tabulated (PE).</p>	<p>A poem/cinquain/acrostic on the human heart. Assessment should include creativity, expression, volume and accuracy.</p> <p>Write of a practical activity on the effect of exercise on heart rate.</p>	<p>Charts</p> <p>Models</p> <p>Apparatus</p> <p>Students</p>

Topic: The Human Body

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Conduct experiments to investigate the effect of exercise on heart rate;</p> <p>Display the data in an appropriate manner;</p> <p>Interpret data from a given graph.</p>		<p>Calculation of average pulse rate at rest and after exercise information related to the effect of exercise on heart rate (M)</p> <p>Drawing of graph for class data at rest and also after exercise (M).</p> <p>Create a skit to explain the effect of exercise on heart rate (D).</p> <p>Students' analysis and interpretation of the graphs. Assessment should be based on accuracy and inferring.</p> <p>Written test</p>	<p>Documentation of the practical activity. It should be assessed for measurement, observation, recording, reporting and inferring.</p> <p>The calculation and graphs to be assessed for accuracy, plotting, axes and title.</p> <p>The skit should be assessed using a rubric that covers creativity and content</p>	<p>Charts</p> <p>Models</p> <p>Computer with internet access</p> <p>Multimedia projector</p>

Topic: The Human Body

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Discuss the importance of water in the human body;</p> <p>Relate the properties of water to the functions in the human body.</p>	<p>Water is needed to keep the internal environment of the body in equilibrium.</p> <p>Water is a solvent It can dissolve many substances so it transports digested food; toxin and gases around the body.</p> <p>It flows and changes shape there it can move around the body.</p>	<p>Research to find out about the importance of water in the body. Note taking followed by class discussion.</p> <p>Role playing activity about the role of water in the human body</p>	<p>Creating a skit to share information about the importance of water in the human body.</p>	<p>Internet</p> <p>Books</p>

Topic: Agricultural Science

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Define the term livestock;</p> <p>List three breeds of cattle reared in the Caribbean;</p> <p>Name the two types of cattle;</p> <p>Describe the two types of cattle;</p> <p>Name products of the raw materials obtained from cattle;</p> <p>Discuss the importance of cattle to Agriculture in the Caribbean;</p>	<p>Holstein, Zebu and Red poll</p> <p>Dairy and beef cattle</p> <p>Milk – butter; cheese</p> <p>Hides – leather</p> <p>Cattle provide jobs; income; foreign exchange and raw materials,</p>	<p>Brainstorming session on livestock and cattle. Students to write definitions for these terms.</p> <p>Students to research cattle using any available media. Information to be documented and shared in an oral presentation.</p> <p>Students to visit a cattle farm, if convenient, to observe how the animals are reared.</p>	<p>Written test</p> <p>Oral presentation reporting on the visit to the farm. Assessment should be based on content (volume and accuracy) and delivery.</p> <p>Create a chart to serve as stimulus material for the teaching about cattle (VA). Students should be assessed on creativity and content.</p>	<p>Pictures</p> <p>http://www.bbc.co.uk/dna/h2g2/A604270</p> <p>http://www3.telus.net/public/cvaage/livestock.htm</p> <p>Personnel at the farms visited</p> <p>Computer with internet access</p>

Topic: Agricultural Science

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Define the term aquaculture;</p> <p>Name three fish reared;</p> <p>Describe how the fish farms are created;</p> <p>State two advantages of aquaculture;</p> <p>List two disadvantages of aquaculture.</p>	<p>Rearing of aquatic organisms for food.</p> <p>Salmon; shrimp; tilapia; trout</p> <p>Large tanks can be constructed with pumps to house the fish or enclosed cages can be placed below the surface in shallow water; fish are feed; growth monitored and harvested when appropriate.</p> <p>Provide large amounts of fish in a short space of time; provides jobs; generates income.</p> <p>Chemical used can wash into the sea and cause contamination, thus destroying aquatic life; diseases which originate on farm could spread to wild populations making them ill.</p>	<p>Teacher to display pictures of fish farms for students to create their own definitions of what aquaculture is.</p> <p>In small groups students to use the internet to research fish farming. A worksheet should be provided for recording information.</p> <p>Multi-media presentation on aquaculture.</p>	<p>A mobile/ collage of what aquaculture is. It should be assessed for creativity, visual impact and content.</p> <p>An advertisement to be used on television to encourage Barbadians to practice aquaculture. The assessment tool should include creativity, appeal, language and content.</p>	<p>Personnel at the farms visited</p> <p>Computer with internet access</p>

Topic: Weather

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Define the terms weather and climate;</p> <p>State the period when hurricane season is active;</p> <p>List the characteristics of tropical depressions, storms and hurricanes;</p> <p>Describe how hurricanes are formed;</p> <p>Label the parts of the hurricane;</p> <p>Discuss the need for hurricane preparedness.</p>	<p>Weather is the condition of the atmosphere at a particular point in time. Climate refers to weather patterns over a period of time.</p> <p>Hurricane season – June 1 to November 30</p> <p>Depression – winds less than 34 mph; storm – winds 34 to 63 mph; hurricane 64 – 140 mph.</p> <p>Swirling air surrounding central area of low pressure’</p> <p>Hurricane preparedness can ensure that an individual preserves his/her life.</p>	<p>Guided discussion on the terms to ascertain students’ prior knowledge. Dictionary work to obtain and record meanings.</p> <p>Research, in small groups, to obtain information on weather phenomena. Students to complete a worksheet.</p> <p>Discussion sessions to follow.</p> <p>Video tape of hurricane formation. Students to make notes of the stages in hurricane formation.</p> <p>Photographs of the destruction caused by hurricanes to act as stimulus for class discussion on hurricane preparedness</p>	<p>Pen and paper test include both objective and higher order questions.</p> <p>Booklet on facts about the various weather phenomena. Assess the information booklets by using rubric including creativity, content, audience appeal, visual impact.</p> <p>In groups students to create skit based on the approach of a hurricane and appropriate preparation. Rubric should include accuracy of content, volume of content, impact, creativity</p>	<p>http://ww 2010. Atmos.uiuc.edu</p> <p>http://www.brainpop.com/ask/quiz/?refer=/science/weatherandclimate/hurricanes</p>

Topic: Natural Resources (Soil)

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Define the term soil;</p> <p>Name different types of soil;</p> <p>Describe the different soil types (clay, loam and sand);</p> <p>Monitor plant growth in various soil types;</p> <p>Discuss the effects of soil type on plant growth;</p>	<p>Soil is the upper layer of the earth which supports plant growth.</p> <p>Clay – made of tiny particles and small air spaces. Becomes water-logged easily.</p> <p>Sand – large particles with large air spaces. Water retention is low.</p> <p>Loam – moderate- sized particles, gritty, retain adequate amounts of water</p>	<p>Teacher to provide samples of soils for students to interactive with. Students to formulate a definition for the term soil as well as the characteristics of each. Discussion should follow.</p> <p>Students to germinate seeds and record/ measure plant growth by counting number of leaves or height of plant. A graph of the data should be drawn. (M) A - Use different soil types in art e.g. Art</p>	<p>Write up of the practical activity on soil types and usefulness in Agriculture. Skills assessed should include manipulation, observation, recording and inferring. Objective tests on soil types.</p> <p>Practical write-up of the activity designed to measure plant growth in different soil types. Skills to be graded design, manipulation, recording, reporting and inferring. Oral presentation discussing the effects of soil type on plant growth</p>	<p>Transparent jars</p> <p>Variety of soil samples</p> <p>Spoons</p> <p>Filter paper</p>

TOPIC: Energy				
ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>The pupil should be able to:</p> <p>List the different types of energy;</p> <p>Identify the form (s) of energy in named items or situations;</p> <p>Identify the energy transformations which occur in common household items and given situations.</p>	<p>Energy exists in the following forms: chemical; electrical; heat; kinetic; light; nuclear; potential; solar; sound.</p> <p>A ball on a table has potential energy; food and petrol contain chemical energy; a moving object has kinetic energy; lamps and other light sources give out light and heat.</p> <p>Television – electrical to sound, light and heat</p> <p>Washing machine – electrical to movement</p>	<p>Class discussion to ascertain students’ ideas about energy. Brainstorming on the various forms of energy. Students to conduct research on internet or provided material.</p> <p>In groups students to be given pictures to suggest the energy present or the energy transformations which take place. Class discussion to follow.</p> <p>Comprehension passage for student to source answers to questions related to energy transformations.</p>	<p>A booklet or poster on energy types. Content, accuracy of information language, attractiveness and creativity may be included in the rubric.</p> <p>Skit on energy transformations (D). Assessment may include volume and accuracy of content, audience appeal, language, body language.</p> <p>Short story on life without energy transformations.</p>	<p>Pictures/video</p> <p>Household items</p> <p>Computer with internet access</p> <p>http:// teacher. Scholastic.com</p>

TOPIC: Forces

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Define gravity;</p> <p>Explain gravity in relation to falling objects;</p> <p>Make a parachute;</p> <p>Explain how parachutes work to counteract gravity;</p>	<p>Gravity is the force which holds items in place on the earth's surface and prevents them floating off into space.</p> <p>Gravity causes objects to fall toward the earth. The parachute, because of its light weight and large surface, creates drag and slows down the falling object,</p>	<p>Teacher to show video clip of astronauts on the moon for students discuss why they are floating. If term gravity is not mentioned, teacher can introduce it.</p> <p>Practical activity involving the dropping of items of different masses from the same height and timing the fall. Students to predict results before conducting experiment. Discussion to follow.</p> <p>Students to take two similar sheets of paper. One sheet should be bunched into a ball. The two pieces of paper should be release from same height and the time to reach the ground recorded. Students should predict results. Students to make conclusions.</p>	<p>Students to create a fact cube on gravity. It can be assess for visual impact and volume and accuracy of content.</p> <p>The parachute which is made.</p>	<p>Books</p> <p>Pictures/ Photographs</p> <p>Materials for making a parachute</p>

TOPIC: Forces				
ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Define friction;</p> <p>List factors that affect friction;</p> <p>Discuss how friction is useful to man.</p>	<p>Friction is the force which exists between two surfaces which are rubbing against each other.</p> <p>Smoothness of surfaces; weight of objects; amount of surface area contact</p> <p>Friction slows down moving vehicles; keeps us from sliding when walking on wet surfaces; can even produce heat to start a fire</p>	<p>Students to use the dictionary to find the meaning of the term friction.</p> <p>Students to carry-out an experiment where they roll car down a slope and measure the time. A variety of materials should be used on the slope one at a time. The results should be compared and conclusions made.</p> <p>Brainstorming to ascertain how friction is useful. Research project on the usefulness of friction.</p>	<p>Practical activity to be assessed for measuring, manipulation, observation, recording and inferring.</p> <p>A fact book on forces. Assessment should include creativity, content, concepts, accuracy, language and appeal.</p>	<p>Paper Wood Oil Sand paper Gravel</p>

TOPIC: Forces

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Define the term “machine”;</p> <p>Name five simple machines used in the home</p> <p>Identify common objects that are levers ;</p> <p>State how the levers are used by man;</p> <p>Demonstrate how levers operate.</p>	<p>A machine is any object which makes work easier.</p> <p>Knife, scissors, nutcracker, broom, wheelbarrow, pencil sharpener are simple machines.</p> <p>Examples of levers are: see-saw; crow bar; scissors; bottle opener; hammer and pliers.</p>	<p>Students, in groups, to be given pictures or samples of simple machines for them to generate a working definition of the term machine. Discussion session to follow.</p> <p>Students to list the machines displayed and give descriptions of each. Oral presentations to follow.</p> <p>Students to be given information on machines to read, determine the different types of machines as well as note examples and a description of levers.</p> <p>Students to research the lever and cite examples of how man uses levers on a daily basis. Students to choose a lever and bring it to school for a show and tell session.</p>	<p>Students recording of the information obtained from the comprehension passage. Assess for volume and accuracy of information, neatness, and language.</p> <p>Students to create six diagrams for use on a calendar showing ways how man uses levers. Project may be assessed for appeal, visual impact, correctness of information.</p> <p>Presentation may be assessed for audience appeal; eye contact; diction; accuracy and relevance of information.</p>	<p>Internet</p> <p>Pictures</p> <p>Video</p> <p>Film</p>

TOPIC: Solid Waste

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Define the term solid waste;</p> <p>Define the term landfill;</p> <p>State the name of a landfill in Barbados;</p> <p>Describe how a landfill works;</p>	<p>Trash or garbage produced daily in homes and other places</p> <p>A well-managed, area designed for storing and compacting trash.</p> <p>Mangrove</p>	<p>On a map of Barbados indicate where the landfills and sanitation department are located</p> <p>Students to be questioned about what they understand by the term landfill or be shown a picture for them to generate a working definition of the term.</p> <p>Visit to a landfill/research via internet about the functioning of a landfill. Students to complete worksheet.</p>	<p>Written or oral report on the visit to the landfill/ research. This project to be assessed for delivery, appeal, language and content.</p> <p>A handbook to assist the public with effective ways to reduce litter. Assessment should include creativity, content and appeal.</p> <p>A flow chart or concept map on how a landfill works. Concepts and accuracy may be used for assessment.</p>	<p>Gloves</p> <p>Glue</p> <p>News paper articles</p>

TOPIC: Solid Waste

ATTAINMENT TARGETS	CONTENT	SUGGESTED ACTIVITIES	ASSESSMENT	RESOURCES
<p>Discuss the need to reduce the volume of solid waste in Barbados;</p> <p>List ways of reducing the amount of solid waste produced in the school/ home;</p> <p>List some large items that are disposed of in an indiscriminate manner;</p> <p>Discuss the effects of indiscriminate dumping on the environment.</p>	<p>Using re-useable bags; buying in bulk to decrease amount of packaging; Reusing items instead of discarding them.</p> <p>Stoves; washing machines; refrigerators</p>	<p>Students to research garbage in Barbados by contacting the Sanitation Service Authority and the Solid Waste Management unit.</p> <p>Students to write a letter to a friend about the need to reduce solid waste in Barbados.</p> <p>Discussion/ brainstorming on indiscriminate disposal of large items. A video or picture may be used as stimulus material.</p>	<p>The letter written to the friend. The rubric should address format, appeal, ingenuity, content and accuracy.</p> <p>Posters on how to reduce garbage/ litter in schools to be placed in strategic places on the school compound. Assess for volume of content, accuracy of information, creativity, visual impact and language.</p> <p>Brochure to inform the public about the need to desist from indiscriminate dumping.</p>	<p>Personnel at the landfill</p> <p>Computer with internet access</p>

Appendix A

Skills to be developed during study of this curriculum are:

1. Observation
2. Recording
3. Reporting
4. Classification
5. Sequencing
6. Investigation
7. Analyzing
8. Interpreting
9. Inferring
10. Predicting
11. Hypothesizing
12. Drawing
13. Manipulation
14. Measuring

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APPENDIX B

DRAWING OF BIOLOGICAL SPECIMENS

- Please note that there is a difference between a diagram and a drawing.

A diagram is not a true representation of an object. It shows how one item/part relates to another.

A drawing is a true representation of an object.

- Points to consider when attempting biological specimens

- use a hard, sharp pencil

- ensure that the drawing is large and clear

- make the drawing an accurate reflection of the object

- the lines should be smooth and continuous to create a consistent tone

- parts of object should be proportionate

- drawing should have a title with magnification and view if appropriate

magnification is calculated as follows: $\frac{\text{length of drawing}}{\text{length of object}}$

- do not shade or colour

- label lines should be drawn with a rule

- labels should be written parallel to each other

- label lines should carry no arrowheads or dots

RECOMMENDED TEXTS

1. Douglass Raphael and Trevor Garcia. Primary Science For The Caribbean Series (A Process Approach), Oxford: Heinemann Educational Publishers, 1997
2. Russell Tony. Primary Science For The Caribbean (An Integrated Approach) Series. Cheltenham: Nelson Thornes, 2003
3. McClenan Vilma, Marceline Collins-Figueroa, Marva Griffith-Green and Hortense Morgan. First Steps In Science Series and Activity Books. Jamaica:Carlong Publishers (Carib.) Ltd, 1994
4. Mitchelmore June. Finding Out Primary Science for the Caribbean Series. Macmillan Caribbean Ltd, 1993
5. Glover David and Glover Penny. Bright Ideas. Macmillan Caribbean Ltd, 2008

Websites

<http://www.kidsites.com/sites-fun/activities.htm>

<http://jonathan.mueller.faculty.noctrl.edu/toolbox/>

<http://rubistar.4teachers.org/index.php>

<http://arc.missouri.edu/pa/olive.html>

http://davidlazear.com/Multi-Intell/MI_chart.html

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