

**PRIMARY SCIENCE CURRICULUM GUIDE
GRADE 5**

Unit 1: Human Body - Parts of the body and their roles for healthy living.

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration			
	Knowledge	Skills	Attitude								
Effects of exercise	Observe and discuss the effects of exercise on breathing rate	Predict the effects of exercise on breathing rate Demonstrate the effects of exercise on breathing rate Record and interpret results of experiment-	Develop an awareness of the need for regular exercise	Our breathing rate increases when we exercise. This is because the cells of our muscles need extra food and oxygen when we exercise. Our lungs will therefore work faster to supply more oxygen and go back to normal when we stop exercising.	<ol style="list-style-type: none"> 1. Pupils predict the effects of exercise on breathing rate. 2. Pupils plan their experiment to test their predictions. 3. Following class discussion with teacher on proposed testing, pupils agree on procedure. 4. Pupils either exercise for different lengths of time or vary the type of exercise e.g. walking, running, as follows: <ol style="list-style-type: none"> (a) If they change the length of time, they should keep the type of exercise the same each time. (b) If they change the type of exercise, they should keep the length of time they exercise for the same each time. 5. Pupils measure their breathing rate by holding their hands on their rib cage and counting how many breaths they make in a minute. They should also take the breathing rate at rest (normal) for comparison. 6. Results can be recorded in the form of a table eg. <table style="margin-left: 20px; border: none;"> <tr> <td>Exer-cise</td> <td>Exer-cise time (min)</td> <td>Breath-ing rate (breaths per minute)</td> </tr> </table> 	Exer-cise	Exer-cise time (min)	Breath-ing rate (breaths per minute)	Clock, stop watch	<p>Were pupils' predictions realistic? Were pupils plans for their experiments appropriate? How did the results compare with the pupils' predictions?</p> <p>Do the graphs reflect a meaningful comparison?</p>	Health and Family - Life Education - Keeping healthy and physically fit. Mathematics - Graphs
Exer-cise	Exer-cise time (min)	Breath-ing rate (breaths per minute)									

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Effects of exercise on heart beat rate	Discuss the effects of exercise on heart beat rate.	Predict the effects of exercise on heart beat rate. Demonstrate the effects of exercise on heart beat rate. Record and interpret results of experiment	Develop positive or healthy attitude to exercising.	In children the heart beats about 100 to 120 times a minute. In grown people it beats about 70 to 90 times a minute. When we exercise the heart beats hard and fast. The cells of our muscles need extra food and oxygen when we exercise. So the heart must beat faster and work harder to take more blood to the muscles.	<p>7. Results can be represented as line graphs. One graph for each type of exercise. Breathing Rate (breaths per min) Exercise time (min)</p> <p>8. Results are interpreted during class discussion.</p> <p>1. Recap – Main parts of the circulatory system. Heart as the pump and blood vessels namely arteries, veins and capillaries. Simply state functions of arteries, veins and capillaries.</p> <p>2. Pupils predict the effects of exercise on the heart beat rate.</p> <p>3. Pupils plan their experiment to test their predictions. 3. Following class discussion with teacher on proposed testing, pupils agree on procedure.</p> <p>4. Pupils could perform the following experiment. Take the resting pulse rate for one minute and record it. (<i>a pulse can be taken by placing the first two fingers of one hand on the inner side of the wrist of the other hand</i>). (b) Pupils run in place or jump on the spot for one minute.</p>	Clock, stop watch	Were pupils' predictions realistic? Were pupils' plans for their experiment appropriate? Did pupils have difficulty in taking their pulse?	Health and Family Life Education _ Keeping healthy and physically fit.

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					<p>c) Pulse rate is then taken and recorded. (d) Pulse rate is then taken every two minutes over the next ten minutes and rate recorded. (e) Pupils compare pulse rate before exercise, immediately after exercise and ten minutes after exercise.</p> <p>5. Class discusses results and makes conclusions.</p>		How did the results compare with the pupils' predictions?	

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Effects of high- fat diets	Discuss the effects of high-fat diets on the heart.	Interpret observations	Develop an awareness of the dangers of high-fat diets and thereby avoiding such diets.	The blood travels around our body in blood vessels called arteries, veins and capillaries. Too much fat in our diets causes these vessels to become blocked. This leads to hypertension (high blood pressure) and can result in heart attacks.	1. Pupils suggest effects of diets high in fats. 2. During class discussion teacher gives simple, but not detailed explanation, of these effects. 3. Pupils observe (a) samples of foods rich in fats (b) picture of foods/diets high in fats (c) boxes, wrappers and labels of foodstuffs showing content or composition. 4. Class summarises guidelines for providing low-fat diets. 5. Pupils share guidelines with family members and encourage their adoption.	Samples of foods rich in fats. Pictures of foods/diets high in fats. Boxes, wrappers or labels of foodstuffs.	Did pupils suggest effects of high-fat diets? Were pupils willing to share guidelines with family members?	Health and Family Life Education - Guidelines for healthy living.

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Wastes of the body	Identify wastes of the body. Observe and identify ways in which the body gets rid of these wastes.	Record observations in the form of a table	Willingness to observe good hygiene practices in keeping the body clean especially with regard to urine and sweat.	Our body produces waste products which must be given off. The giving off or removal of wastes is called excretion . These waste products include carbon dioxide, urine and sweat . Carbon dioxide is given off through the nose when we breathe out or exhale. Waste products from the blood are collected by the kidneys and sent to the bladder as urine and then excreted. Sweat is given off by the skin through perspiration.	1. Pupils identify waste products and by which organ each is excreted. 2. Pupils briefly explain how each product is excreted. 3. After class discussion with teacher, information is summarized in the form of a table thus: Waste Product-Organ-How Excreted ----- ----- 4. Teacher explains that faeces removal is the end process of digestion called egestion .	Model of internal organs of human body Pictures/ charts showing internal organs of the human body	Were pupils able to name the waste products and related organs? Were pupils able to say how the body gets rid of the wastes? Can pupils explain what is egestion?	Health and Family Life Education - Keeping healthy

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Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
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Effects of smoking	Discuss the effects of smoking on the body.	Demonstrate the effects of smoking on the body. Observe and interpret results from demonstration	Develop an awareness of the dangers of smoking and thus avoid the bad and unhealthy habit.	The nicotine in tobacco tends to make the heart beat faster. Tobacco smoke in a smoker's lungs cuts down on the amount of oxygen available to the heart and bloodstream. Smoking raises blood pressure by narrowing the blood vessels and making the heart beat faster. Smoking is a main cause of cancer. It results in stained teeth and lips, offensive breath and can ruin relationships. Smoking is an expensive habit.	This demonstration can be done by someone who smokes, teacher, school employee or parent. Smoker inhales from a lighted cigarette, holding the smoke in the mouth without allowing it to go into the lungs. Place a white handkerchief over the mouth stretched as firmly as possible. 3 Blow the smoke back through the handkerchief; a dark stain will be left.	Cigarette Matches Handkerchief	Were pupils familiar with the effects of tobacco smoke? Were pupils surprised at the stains or the amount of tar in inhaled and exhaled cigarette smoke?	Health and Family Life Education - Dangers/ Effects of smoking.

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					6. Note the difference between the two stains. 7. Pupils also state some harmful effects on health and social relationships. 8. Class discusses these effects. 9. Working in small groups, pupils make posters showing the harmful effects of smoking. Pupils display posters in class and school.			

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Effects of drugs	Discuss the effects of drugs on the body. Identify useful and harmful drugs	Classify drugs as useful or harmful.	Develop an awareness of the effects of useful and harmful drugs. Develop the healthy attitude of using only useful drugs.	We use drugs to treat diseases and relieve pain. If the drugs are not used properly some can cause severe health problems and even death. Patent medicines, over the counter (OTC) and prescribed drugs or medicines usually have beneficial effects. Harmful or dangerous drugs include alcohol, nicotine from tobacco, caffeine from coffee and tea, marijuana (ganga) and cocaine (coke).	1. Pupils name some common drugs, both useful and harmful. 2. Class is divided into small groups and discusses the effects of the drugs. 3. Pupils look at pictures of persons using drugs and their effects on them. 4. Teacher and pupils provide labels, wrappers and packets that have information on the effect of the drugs e.g. patent medicines and cigarette as on cigarette packet/box. . 5. Pupils share information during class discussion. 6. Teacher and class place drugs into two groups, useful and harmful (illicit) drugs.	Pictures of persons using drugs and the effects of such drugs. Labels, empty wrappers and packets. Resources for research and presentation of projects e.g. books, magazines, newspapers writing paper, cardboard, markers.	Were pupils able to name some patent and illicit drugs? Was information on labels, wrappers and packets useful? Did pupils identify the effects of both types of drugs?	Health and Family Life Education and Social Studies - Effects of Useful and Harmful Drugs.

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Unit 2: Animal Kingdom - The Variety, features and life processes of animals

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
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External features of invertebrates	Identify external features of invertebrates	Observe invertebrates to identify external features.	Display respect for life by handling organisms with care. Display safety / precautions to avoid harm to organisms and injury to themselves.	Invertebrates, that is, animals without backbones have different external features. Their body covering varies from soft as in worms to a hard shell as in crabs. Some invertebrates have no legs, others have six, eight, ten and even many more legs. Also, some have no wings, while some have one and two pairs of wings.	<p>1. Teacher and pupils provide a wide variety of invertebrates such as earthworm, millipede, insects (e.g. ants, flies, butterfly, beetle) spider, snail, crab, shrimp. Both living and preserved specimens would be useful.</p> <p>2. Pupils work in small groups. They examine and observe the external features of the organisms. <i>Teacher gives class safety precautions e.g. not putting fingers in their mouth after touching organisms.</i></p> <p>3. Pictures of invertebrates can be used in observing and identifying their external features.</p>	Wide variety of invertebrates – live or preserved specimens e.g. earthworm, millipede, ant, fly, beetle, snail, crab, shrimp. Pictures of invertebrates.	<p>Were pupils familiar with external features of invertebrates?</p> <p>Were pupils able to use the external distinguishing features?</p>	Environmental Education and school yard ecology – Variety of invertebrates.

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Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
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Life cycle of insects	Identify the stages in the life cycle of an insect showing complete or gradual metamorphosis and another showing incomplete or direct metamorphosis.	Observe stages in both complete (gradual) and incomplete (direct) metamorphosis. Record observations in a table. Make inferences from observations.	Display respect for life by handling organisms with care. Display safety precautions to avoid injury or harm by organisms	Many young insects do not look like the adult. Insects develop in stages. The sequence of stages is called metamorphosis (many changes of form). For example, the butterfly passes through four stages of egg, larva (caterpillar) egg, larva, (caterpillar), pupa and imago (adult). This is called complete or gradual metamorphosis.	<i>This lesson should be spread over a few weeks.</i> 1. Teacher and pupils look in flower or kitchen garden for eggs laid by butterfly or moth on leaves, usually the lower surface. 2. If eggs are not found, teacher and pupils should look for larva or caterpillar. 3. Eggs or larva are placed in a box or bottle and covered with a net or gauze-like material to allow gases to enter and leave. 4. The caterpillar is fed with leaves from the tree on which it was found.	Egg, larva (caterpillar) pupa, adult butterfly or moth. Egg, nymph and adult cockroach or grasshopper Honey bee or wasp (marabunta) nest Pictures of stages in life cycle of insects	Were pupils familiar with insects? Were pupils able to observe the different stages in the metamorphoses and their main distinguishing features?	Agricultural Science and School Yard Ecology - Life cycle of insects.

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Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
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		Draw the stages of metamorphosis of chosen invertebrates.		The cockroach passes through three stages of egg, nymph and imago (adult). This is called incomplete or direct metamorphosis. Other insects that show complete (gradual) metamorphosis are the housefly, mosquito, honey	5. Pupils observe specimen daily and note changes in the form of a table. DAY OBSERVATION 6. As a substitute or to support changes, part of a honey bee or wasp (marabunta) nest could be used, opened and observed over four days. Note: <i>Caution is necessary when handling and transporting nests. Do not ask pupils to collect nests. Care taken to avoid being stung by insects.</i> 7. Teacher and pupils look for and examine the eggs of cockroach or grasshopper.		Can pupils distinguish between complete (gradual) and incomplete (direct) metamorphosis?	

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Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
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Life cycle of frog or toad	Identify stages in the life cycle of a frog or toad.	Observe stages in the life cycle of a frog or toad.	Display respect for life by handling organisms with care.	Bee, wasp and moths. Incomplete or direct metamorphosis also occurs in the grasshopper. Frog and toads are amphibians and can live in water and on land. Most frogs or toads begin their life-cycle in water as the eggs can develop only under moist or wet conditions.	8. Pupils observe specimen daily for two weeks, observe changes and record same in the form of a table as before. 9. Class discusses and summarises observation,. 10. Pupils make simple drawings of stages in both types of metamorphoses. <i>This lesson will take a few weeks</i> 1. Teacher and pupils collect some pond/stream water with frog/toad eggs and place same in a transparent container.	Pond/ stream water with frog/toad eggs Tadpoles	Were pupils familiar with amphibian eggs or tadpoles? Did pupils observe changes?	School Yard Ecology - Life cycle of amphibians

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Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
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		Record observations on stages of the life-cycle of amphibians.		The eggs hatch into a larval stage called tadpole. The tadpole lives in water and develop into young frogs, as shown below. Egg tadpole Frog/ young toad frog/toad	2. To the sample of water, pupils add some plant materials. 3. Pupils observe specimen over a period of time noting changes and recording observations in the form of a table DAY OBSERVATIONS 4. Observations are compared with those of complete (gradual) metamorphosis in insects. 5. Class discusses observations and make conclusions.		Did pupils compare metamorphosis with that in insects?	

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Unit 3: Plant Kingdom - The variety, features and life processes of plants

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
Func-tions of leaves	State that leaves make food for plants.	Test leaves for the presence of starch.	To display care and safety in using equipment, chemicals and heat.	The leaves of a plant make its food. The green colouring matter of the leaf called chlorophyll traps sunlight and combines it with water from the soil, and carbon dioxide from the air to make carbohydrates and produce oxygen gas as a by-product. This process is called photosynthesis (<i>photo</i> -light and <i>synthesis</i> - building up).	To show photosynthesis, leaves can be tested for the presence of starch. This experiment involves the use of heat and should be done as a demonstration by the teacher. 1. Pupils detach (pick) two small leaves from two plants that have been in sunlight for a few hours. A totally green leaf and a variegated (of different colours) leaf, say from the hibiscus, would be useful. 2. Teacher places leaves in boiling water in a beaker or any suitable container to kill them. 3. Teacher then places the dead leaves in alcohol or methylated spirits in a test tube, smaller beaker or any other suitable container to extract the chlorophyll or the green colouring matter.	Green leaf, variegated leaf, 2 beakers (small and smaller) or suitable containers 1 test tube (small) water, alcohol or methylated spirits, iodine solution, potato, heat source.	Did pupils follow steps in demonstration done by teacher? Did pupils understand why alcohol or methylated spirits was not heated directly or why a water bath was used? Did pupils understand the need to carry out the starch test?	Agricultural Science - Food from plants.

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Unit 3: Plant Kingdom - The variety, features and life processes plants

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
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					<p>Note: <i>Alcohol and methylated spirits are flammable and should not be heated directly but rather in a water bath, that is, in a container of heated water.</i> 4. Place the brittle leaves in the hot water to soften them. 5. Dry the leaves, place them on a clean flat surface, add a few drops of iodine solution to them and observe.</p> <p>Note: The Starch Test <i>Iodine solution added to a known starchy surface e.g. potato, turns bluish black or purple.</i></p>		Was it useful to use a variegated leaf?	

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Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
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	State that leaves give off excess water in the form of vapour.	Set up simple apparatus to show loss of excess water by leaves.	Display care and accuracy in setting up apparatus for experiment.	Water that the plant does not use in the form of vapour is given off by any exposed part of a plant mainly the leaves. This process is called transpiration . In the leaves, this is done by tiny openings called stomata (singular stoma) found mainly on the under surface of the leaf. Leaves breathe for the plant. That is, they take in and give off oxygen and carbon dioxide.	Pupils should use well-watered plants. Over one branch of a potted plant, pupils will tie or secure a clear cellophane or plastic bag on the stem. For another branch of the same plant, pupils will remove all the leaves and tie or secure another clear cellophane or plastic bag on the stem. Pupils will leave the plant in the sunlight for a few hours and then observe the cellophane or plastic bags. As an alternative, pupils may use two different potted plants or plants growing in the ground.	Potted plants, plants growing in the earth, cellophane or plastic bags. Twine/ String, anhydrous copper sulphate, cobalt chloride paper	Did pupils tie or secure cellophane or plastic bags properly? What was observed in the cellophane or plastic bags? Was it possible to verify or test the vapours collected?	

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Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
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Mono-cotyledons and dicotyledons	State the features of monocotyledonous and dicotyledonous plants.	Observe features of monocotyledons and dicotyledons.	Display care in handling plants.	<p>Flowering plants that have one cotyledon (or seed leaf) in their seeds are called monocotyledons. Those plants that have two cotyledons (two seed leaves) in their seeds are called dicotyledons.</p>	<p>Note: <i>It is better or 'experimentally correct' to test the vapour in the cellophane or plastic bags to show whether it is water or not.</i> This can be done by using <i>either</i> (a) anhydrous (white powdered) copper sulphate which turns blue with the addition of water, <i>or</i> (b) cobalt chloride paper (blue) turns pink with the addition of water. 1. Teacher and pupils provide a wide range of seeds e.g. corn, paddy, awara, black-eye, bora, mango, coconut, peanut, pigeon peas, carilla. 2. Pupils examine the seeds provided to determine if the cotyledon or inner food store is in one or two pieces.</p>	Variety of seeds such as corn, paddy, awara, blackeye, bora, mango, coconut, peanut.	Was the range of seeds adequate and useful? Were pupils able to identify the cotyledons of seeds?	School Yard Ecology - Features of monocotyledons and dicotyledons

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Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
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		Record observations in a table. Classify plants as monocotyledons or dicotyledons using observable features.		Monocotyledons also have parallel-veined leaves and fibrous roots. Some examples are corn, coconut, rice and awara. Dicotyledons also have net-veined leaves and tap roots. Some examples are black-eye, bora, peanut and mango.	Pupils may need to open up some seeds to see the cotyledon. Pupils place seeds into two groups; those with one cotyledon and those with two cotyledons. 3. Pupils visit school yard and school garden and observe plants, especially those of the seeds provided, and examine the type of leaves and roots. 4..Pupils may also examine plants at home and other areas in their environment.	pigeon peas, carilla.	Were pupils able to summarise the main features of monocotyledons and dicotyledons? Can pupils say if a plant is a monocotyledon or a dicotyledon from the type of leaf or root it has?	School Yard Ecology - Features of monocotyledons and dicotyledons

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					<p>5. Pupils will summarise their findings in the form of a table as follows: Plant /Type of Leaf/ Root Sys-tem Coty ledon Plant / Group Bora Net-veined/ Tap 2 Dicoty-ledon See Science Around Us Book 5, Page 56 Pupils then discuss the main features of monocotyledons and dicotyledons.</p>			

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Unit 4: Environment - Components of the environment and their interrelations

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
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The decay of plant and animal materials	State which materials are biodegradable, and which are non-biodegradable.	Investigate how organic (plant and animal) materials decay. Predict which materials decay faster. Make inference	Display proper sanitation in handling dead and decaying materials.	Materials from plants and animals are called organic . These materials include leaves, flowers, fruits, stems and roots of plants. Animal materials include their flesh, faeces, skin, hair, fur. Most of these organic materials rot or decay over a period of time. Similarly, when plants and animals die their bodies rot or decay over a longer period of time.	This topic may be covered in two lessons. Observations however, will be made over a period of two weeks. 1. Pupils will work in small groups. 2. They will use small transparent, plastic containers such as jars and cellophane bags into which they will place a small sample of different materials. 3. Materials to be used can include bread, fruits, vegetables and their peelings, leaves, grass, small pieces of plastic, glass and metal.	Small transparent, plastic containers small, clear, cellophane bags, bread, fruits, vegetables, leaves, grass, plastic objects, glass, metals, water, soil.	Did pupils use a comparable range of materials? Were pupils able to verify their predictions? What is the effect of water and soil in the decay or decomposition of materials?	School Yard Ecology and Environmental Education - Decay of plant and animal materials.

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				<p>This process of decay or decomposition causes substances that make up plants and animals to go back into the earth and the world. Materials such as fruits, paper, cardboard and cotton that decay within a short period of time are said to be biodegradable. Materials such as plastic, glass and metals which will not decay are said to be non-bio degradable.</p>	<p>4. For each material used, three samples should be used as follows: a) by itself b) moistened with water c) covered with soil and moistened with water 5. Water is added periodically as necessary. 6. Pupils will predict which materials will rot or decay first, which will decay later and which will never decay.</p>		<p>Can pupils say what is the benefit of using biodegradable materials?</p>	

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					<p>7. Pupils observe each sample of material daily for two weeks and record observations in the form of a table as follows: Day/Sample In Air / Moistened In Soil</p> <p>8. Pupils compare their predictions with their observations.</p> <p>9. During class discussion pupils should be able to say if water (moisture) and the soil help in the decay of materials and why.</p>			

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Wastes and their disposal	State some common wastes and methods of their disposal.	Classify the different types of wastes and their method of disposal.	Adopt and encourage proper and sanitary disposal of wastes.	Man's activities produce many wastes. Garbage and litter from the home make up domestic wastes. The wastes given off by factories include smoke, fumes, heat and poisonous chemicals. These are called industrial wastes. Agricultural wastes include manure, trash and plastic. Urine and faeces are called biological wastes. Proper and safe methods of waste disposal are necessary to prevent pollution of the soil, water and air.	1. Pupils work in small groups. 2. They make a brief visit to school yard and observe litter, garbage and rubbish heap. They make a list of wastes produced in the home, farm, factory, etc. , and group them as follows: Home / Farm / Factory Others 3. Pupils consider ways by which each set of wastes can be best disposed of.	Pictures of different types of wastes and their methods of disposal.	Was there litter, garbage or rubbish in school yard? Were pupils able to identify different types of wastes? Were pupils familiar with the methods of waste disposal?	Environmental Education, School Yard Ecology, Agricultural Science, Social Studies - Wastes and their disposal. Art and Craft - Making posters

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				<p>These methods include (a) Proper collection and storage of wastes. (b) Recycling wastes that are reused in the manufacture of new materials and goods. Biodegradable wastes eg. grass and faeces, can be recycled to produce compost and biogas. Non-biodegradable wastes eg. glass and plastic can also be recycled. (c) Burning combustible material (d) Proper disposal of faeces and urine</p>	<p>4. Following class discussion, pupils summarise information in the form of a table Source / Waste / Means of Dis-posal</p> <p>.....</p> <p>Ref: Science Around Us, Book 6, Page 32. 5. Each group would make a poster showing the proper disposal of a different type of waste.</p>			

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				(e) Filling up land, and useless ponds and trenches with wastes. (f) Proper management of sites with dumped wastes ('garbage dumps').	<i>See Appendix 50 Ways to Reduce Your Waste by the Environmental Protection Agency (EPA), Guyana Note: After the next lesson, class should make a compost pit.</i>			

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Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
Conser- vation of materials	Discuss ways by which materials including resources can be conserved.	Observe both accept- able and unaccep- table effects of using materials or resources	Instill habit of conserv- ing materials/ resources.	Materials that we use in the home, school and at the workplace must be used properly and wisely so as to preserve them and prevent wastage. These materials include foodstuff, clothing, stationery, furniture, medicines and agricultural inputs. Other materials such as the soil, water and minerals are called natural resources .	1. Pupils work in small groups. They discuss ways by which materials including resources can be used wisely or conserved. They may use books and magazines and also view posters and pictures as provided by bodies such as the Environmental Protection Agency (EPA). 2. Teacher conducts class discussion as groups report, then summarises some common methods of conservation. 3. As a follow-up, each group is assigned the task to prepare, within two weeks, a poster to illustrate a different method of conservation.	Books, magaz- ines, posters, pictures	Were the resource materials useful? Did pupils discuss practical methods of conserva- tion? Were the posters mean- ing- ful?	Technology Education/ Environ- mental Education/ Social Studies - Use of materials including resources. Art and Craft - Making posters

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Unit 4: Environment - Components of the environment and their interrelations

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
				<p>The wise use of materials and their preservation is called conservation. Some methods of conservation include:</p> <p>(a) using only the amount of materials needed. (b) storing properly all unused materials. (c) recycling materials eg. paper, glass, plastic, aluminium cans, as discussed in previous lesson. (d) avoiding the pollution of land, water and other resources in the environment. (e) making alternative uses of some materials, containers, etc.</p>				

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Unit 4: Environment - Components of the environment and their interrelations

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
The causes, effects and prevention of the pollution of land, water and air	Discuss the causes, effects and prevention of pollution of land, water and air.	Use research skills in project work.	Reinforce the practice of reducing or even preventing pollution..	The improper use of materials which results in harm to the environment leads to pollution . Pollution is often caused by man and affects land, water and air. Land pollution often results from the improper disposal of wastes from human activities and from animals. This includes dumping of litter and use of agricultural chemicals. Water is also polluted by litter, garbage and chemicals from factories and by oil spills.	1. Review lesson on methods of waste disposal. 2. Teacher conducts visit to school yard or near-by environment for class to observe any signs of pollution. 3. Pupils give the main causes and effects of pollution during a brief class discussion. 4. Teacher divides class into small groups, at least three or six groups, depending on class size. Each group will do a project on the causes, effects and prevention of pollution of land, water or air. <i>(If there are three groups ,one would deal with land, another with water and the other air. If there are six groups, two would deal with land, water and air respectively.)</i>	Books magazines, posters, pictures cardboard, markers, paste	Were pupils familiar with the main causes and effects of pollution? Did each pupil contribute to the group project? What is the quality of the group reports? Are there evidences of simple research?	Environmental Education/ School Yard Ecology/ Social Studies - Causes, effects and prevention of pollution.

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Unit 4: Environment - Components of the environment and their interrelations

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
				Smoke from fires and vehicles and also toxic fumes from the burning of plastic and rubber pollute the air. Pollution of land results in foul smell, spread of diseases and reduction in soil fertility. Contaminated water spreads diseases such as gastro-enteritis, typhoid, diarrhoea and cholera. Polluted air results in smogs and affects breathing by both plants and animals .	5. Pupils will seek information from as many different sources as possible. They will summarise their work under the headings of causes, effects and prevention . Submission should be on regular-sized card-board. Pictures, photographs, etc. may be submitted. 6. Project may take about two weeks to complete. 7. Group report will be posted up in classroom followed by presentation and discussion. 8. Corrected group submissions can be used in a school exhibition.			

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Unit 4: Environment - Components of the environment and their interrelations

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
Noise Pollution	Define noise pollution and state its effects.	Use research skills in project work.	Develop an awareness of noise pollution and how it affects others.	<p>Damage to the protective filtering layer of the atmosphere, that is, the ozone layer, results in skin and other diseases. Pollution can be prevented by</p> <ol style="list-style-type: none"> 1. proper disposal of wastes. 2. restricting use of agricultural chemicals 3. keeping water ways clear of grass and weeds 4. reduce or stop the burning of plastics and rubber 5. use treated petrol (f) 6. reduce the use of aerosol sprays. <p>Loud unpleasant and unwanted sounds are called noise pollution. Such sounds can make us ill. Noise can cause deafness as well as heart attack, hypertension and stomach ulcers. There are laws to help reduce noise at work and during leisure time.</p>	<ol style="list-style-type: none"> 1. Pupils list examples of noise pollution. 2. They research <ol style="list-style-type: none"> (a) noise pollution at work (b) what can be done to reduce noise pollution 3. Teacher and pupils discuss the effects on general health and hearing. 	Texts, magazines, newspapers, with information on Noise Pollution.	Did pupils find out about noise pollution at work and what regulations/ measures are in place to reduce such?	Social Studies – Give responsibilities

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Unit 5: Weather - Types, features and effects of the weather

Topic	Objectives				Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Content					
Effects of the weather	Discuss the effects of the weather on humans and the environment	Observe the effects of the weather on humans and the environment	Appreciate that the weather has both useful and harmful effects on humans and the environment	The weather which includes the sun, rain and wind, affects humans, other animals, plants and the environment. The sun which provides heat and light helps plants and animals make food to grow and develop. Rain provides water for drinking and other domestic purposes. It also helps plants and animals to grow. Too much rain can result in floods which can ruin homes and crops. Very high tides have a similar effect.	<ol style="list-style-type: none"> 1. Pupils will work in small groups. 2. They will visit the school yard and immediate environment to observe effects of the weather. 3. On return to classroom, pupils will further observe and discuss the effects of the weather. They will use books, magazines, posters, pictures, weather reports from newspapers, etc., to get more information. 4. Pupils summarise effects and present same during class discussion. 	Books, magazines, posters, pictures, weather reports from newspapers	During out door classroom visits, did pupils observe any effects of the weather? Did pupils state both useful and harmful effects of the weather?	Environmental Education, School - Yard Ecology, Social Studies - Effects of the Weather

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Unit 5: Weather – Types, features and effects of the weather

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
				<p>Too little water results in drought which reduces the growth of crops and animals. The wind keeps us cool. It helps birds and some animals to fly. Strong winds can cause damage to life and property. Very strong winds like hurricanes result in damage to buildings, crops, animals and humans.</p>				

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Unit 5: Weather - Types, features and effects of the weather

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
Effects of the sun, water and wind on rocks.	Discuss the effects of the sun, water and wind on rocks.	Observe the effects of the sun, water and wind on rocks. Record and report observations		The sun, water and wind cause rocks to break up into smaller pieces. This process is called weathering . Heat from the sun causes rocks to expand during the day. At nights the rocks cool down and get smaller. When this expansion and contraction occur over a period of time the rocks crack and break up. Rain and water falling on rocks over a long period of time cause some parts to wear away slowly. This can lead to the formation of cracks. The wind can break off small pieces of rocks from larger ones. It can also pick up small stones and sand and hit them against larger pieces of rocks thereby breaking them into smaller pieces.	1. Pupils will work in small groups. 2. They will visit the school yard and immediate environment to observe any signs of weathering. They may look for the effects of water from a pipe or gutter falling on a piece of rock or a concrete surface. 3. On return to classroom, teacher demonstrates the effect of water falling on ice for a few minutes. This can be compared to water falling on rocks. 4. Pupils will discuss further the effects of weathering. 5. Pupils summarise the effects of weathering and present same during class discussion.	Ice, water	During out door classroom visit, did pupils observe any signs of weathering? Was the demonstration of water falling on ice meaningful?	Environmental Education and Social Studies - Weathering of rocks.

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Unit 6: Materials - Properties and changes in the states of matter

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
Solutes, solvents and solution	Explain what is a solute, solvent and solution. Identify solutes and solvents in solutions.	Find out which materials are soluble in some common liquids. Record information in the form of a table		Sugar added to water seems to disappear. However, sugar added to oil does not change. The sugar is said to dissolve in the water but not in the oil. Materials that dissolve in another are said to be soluble . For example, sugar and salt are soluble in water. Materials that do not dissolve are said to be insoluble . For example, sand is insoluble in water.	1. Pupils work in small groups or preferably in pairs. 2. They will test some common house - hold materials for solubility in some common liquids. These materials could include sugar, salt, flour, fruit juice, sand, water, oil, etc. (see list of materials). a) They may use water or drink bottle cap into which they will pour a little of the liquids such as water and oil. b) Using a small plastic or sanitary spoon, they will then put a small quantity of sugar in each cap of liquid. They will leave for a while and then observe what happens. c) They will repeat and test each of the other house-hold materials.	Water/ drink bottle caps, sugar, salt, flour, fruit juice, sand, plastic, milk powder, soap powder, water, oil, oil paint, tar, kerosene	Did pupils observe which materials were soluble in which liquids? Were pupils able to identify the solutes and solvents in the solutions?	Food and Nutrition - Making beverages.

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Unit 6: Materials - Properties and changes in the states of matter

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
				<p>When a substance dissolves in another, a solution is formed. The substance that dissolves is called the solute while that which does the dissolving is called the solvent. <small>solute + solvent=solution</small> Solutes are usually solids while solvents are usually liquids. Oil paint and tar are soluble in kerosene but not in water . While milk and fruit juice are soluble in water but not in oil.</p>	<p>(d) They will record their results and observations in the form of a table as follows: Material Water Oil Sugar soluble insoluble Salt ----- ----- Flour etc. ----- ----- 3. Teacher demonstrates to class the mixing of oil paint with kerosene and then tar with kerosene. 4. Class interprets results of investigations. 5. Teacher introduces the terms dissolve, soluble, insoluble, solute, solvent, solution.. 6. As a follow-up, pupils may at home test other materials for solubility.</p>			

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Unit 6: Materials - Properties and changes in the states of matter

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
The rate at which materials dissolve	State what speeds up the dissolving of materials	Predict what speeds up the dissolving of materials. Manipulate Equipment to test predictions using simple apparatus and materials. Measure volume	Display care and safety when using heated materials.	The rate at which some materials (solutes) dissolve in other materials (solvents) can be increased by stirring and raising the temperature of the solvent. These processes are common in the making of beverages, tea, coffee and in some other cooking procedures.	Pupils will work in small groups. 1. They suggest what speeds up dissolving. (They may say stirring and increase in temperature). They will decide how they will carry out their investigations. 2. They should use sugar, water and small sanitary cups. 3. To investigate the effects of stirring they should pour the same volume of water, about 20 ml, in each of three sanitary cups A, B and C. To each cup they will add the same amount of sugar, about 1 tablespoon, and treat as follows: A= no stirring B = slow stirring C = fast stirring They will note the observations and results.	Sugar water-cold, normal, warm sanitary cups. measuring cylinder or dropping/ medicine pipette, table spoon, plastic spoon	Did pupils make realistic predictions? Were pupils able to verify their predictions? Were pupils able to compare predictions to everyday practices in the home e.g. making beverages, tea, coffee, etc. and cooking?	Food and Nutrition - Making beverages and cooking Mathematics- Measuring volume

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Unit 6: Materials - Properties and changes in the states of matter

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
Separating mixtures	Explain how substances in mixtures can be separated.	Demonstrate the processes of sieving and filtering Draw simple diagrams		Mixtures of substances can be separated by different methods.	4. To investigate the effect of temperature, pupils will repeat step 3 above using instead cold, normal and warm water in cups A, B and C respectively. However, they will NOT stir the materials. They will then note their observations and results. 5. Pupils should repeat step 4 above and stir the contents of each cup. They will also note their observations and results. Pupils will work in small groups. 1. They will be presented with simple mixtures e.g. pebbles and bottle caps, buttons and seeds to be separated.	Peas, rice, sand, salt water, sanitary cups, funnel, table tissue/ paper towel, filter paper.	Did pupils suggest possible methods of separation?	Technology Education - Separating mixtures

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Unit 6: Materials - Properties and changes in the states of matter

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
				<p>Rice can be separated from peas by a sieve or strainer. The rice grains which are smaller will pass through leaving the peas behind. Similarly, rice can be separated from salt by using a finer meshed sieve or strainer. A mixture of salt and sand can be separated by dissolving the salt into a solution and then straining the mixture through a finely-knitted piece of cloth. A better separation is the laboratory filter paper which will prevent the sand grains from passing through.</p>	<p>2. They are then presented with problem situations of how to separate a mixture of a) rice and peas b) rice and sand c) salt and sand 3. They will discuss what methods they could use and then try them. Each group will be given some rice grains, peas, sand and sieves. They will mix some rice and peas and then try to separate them with a sieve. They will then mix some rice and sand and try to separate them with sieve. They will note their observations and results.</p>		<p>Were the sieves effective in separating some mixtures? Was the filter paper more effective than the table tissue or paper towel?</p>	

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Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
					4. Pupils will then try to separate a mixture of salt and sand.	Each group will be provided with at least two sanitary cups, some water, a funnel, two table tissues or a piece of paper towel. They will add some water to the mixture to dissolve the salt in one of the sanitary cups.	They will line the inside of the funnel with a table tissue or pieces of paper towel and place the funnel inside the other sanitary cup.	

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Unit 6: Materials - Properties and changes in the states of matter

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
					They will then gently pour the mixture of salt solution and sand through the funnel. They will note the observations and results.	If laboratory filter paper is available, pupils will repeat 4 (b) above using the filter paper instead of the tissue. They will compare the observations and results. 5. Pupils will make a simple diagram of the filtering apparatus. 6. Teacher will heat the filtrate or salt solution to separate the salt from the water.		

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Unit 7: Earth and Space - Components of the solar system and their inter-relations

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
Phases of the moon	Explain how the main phases of the moon come about. Recognise the main phases of the moon.	Observe and record the shapes of the moon as it travels around the Earth.		The largest and brightest object in the night sky is usually the moon . The moon travels around the Earth in an anti-clockwise direction. It makes a complete orbit in about 28 days (a lunar month). The moon does not produce light of its own. We see it because it reflects light from the sun. At different times of the month different parts of the moon are lit up by the sun.	<i>NOTE: Observation for this lesson will spread over a month.</i> 1. Show how the phases of the moon come about pupils will need a torch light, a beach ball or similar ball and a darkened room. Since a darkened room may not be easily possible, teacher will demonstrate how the activity can be done.	The ball (representing the moon) is suspended or hung in the room.	Someone shines the light representing the sun on the ball from different position.	Look at the ball and see how it appears as different parts are lit up like the phases of the moon. Pupils should do activity at home.

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Unit 7: Earth and Space - Components of the solar system and their inter-relations

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
				<p>As such, the moon appears to have different shapes during the month and these are called the phases of the moon. The moon phases begin with the new moon which we cannot see in the night sky. The next phase is the crescent when only a small part of the moon is visible. The half-moon appears next. As the moon is getting fuller, the phase is called gibbous. When the whole moon is seen it is called full moon.</p>	<p>2. To observe and record the shape of the moon or its phases, pupils should do the following: _0 Divide a page in their note book into 15 large rectangles. Do the same for another page to get a total of 30 rectangles. 1 Observe the moon every evening at about the same time for 30 days and draw its shape for each day in a rectangle. Write the date at the bottom of the drawing in the rectangle. 2 If the evening is cloudy, or the moon cannot be seen, then leave a blank and make the next drawing in the next rectangle.</p>		<p>Did pupils have any difficulty in observing and recording the shapes of the moon for the 30 days?</p>	

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Unit 7: Earth and Space - Components of the solar system and their inter-relations

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
				The phases that follow show the moon beginning to get smaller and so goes through the gibbous, half-moon and crescent stages again until the new moon phase is entered once more.	(d) When drawings are completed, pupils will try to identify the main phases of the moon and compare them with representations shown on calendars, weather/climate reports.			

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Unit 8: Energy: Forms of energy, their sources and effects

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
How sounds are produced	Explain how sounds are produced.	Demonstrate how sounds are produced		Sounds are made or produced as things move back and forth or vibrate. We can sometimes see and feel these vibrations . Knocking, plucking and blowing make things vibrate. For example, knocking drums, plucking guitar strings and blowing flutes produce different sounds. The vibrations make the air vibrate to cause sounds which we can hear.	Pupils will work singly or in pairs and carry out the following activities and observe what happens. 1. (a) Hold firmly near the edge of a desk about 10 cm of a 30 cm ruler. Pull down and release the other end of the ruler. b)Gently hit a bottle with the ruler. 2 Shake some seeds or pebbles inside a bottle. 3 Stretch a rubber band around the thumb and first finger. Pluck the band with a finger of the other hand. e) Blow across the top of an empty bottle then across the bottle with some water.	30 cm ruler, bottle seeds/ pebbles, rubber band, straw, sheet of paper empty tin can, thread/ string scissors, rice/sand	Did pupils observe the production of sounds in carrying out the activities? Did pupils suggest other simple ways of producing sounds?	Health and Family Life Education - Speaking

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Unit 8: Energy: Forms of energy, their sources and effects

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
					<p>Blow across the end of a straw. Flap a piece of paper in the air. Each of the above activities produces a sound.</p> <p>2. Pupils may suggest other single ways of producing sounds.</p> <p>3. To better illustrate the vibrations, pupils will do the following. (a) Work in small groups. (i) Tie firmly a piece of paper over the open end of a tin can. ii) Place some grains of rice or sand onto the paper of the drum. Hit the drum gently with the fingers. What do you hear, see or feel?</p>		<p>Was the improvised drum effective in illustrating vibrations? Were pupils able to identify their voice box and feel it vibrating?</p>	

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Unit 8: Energy: Forms of energy, their sources and effects

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
How sounds travel	Explain how sounds travel.	Demonstrate how sounds travel.	Display care for the ear, the organ for hearing.	Sound travels from the source, through a medium to the receiver. The source is where the sound is produced. The medium may be a solid, liquid or gas. Air is the most common medium. The receiver is the person or thing that receives the sound, for example, the ears of animals.	b) Hold fingers gently on the throat. Say a few words and move fingers until they can feel the voice box. What do you observe? Pupils will work in pairs or small groups. They will carry out the following activities and make observations. a) Snap fingers. b) Gently clap hands. c) Place one ear on desk top and gently tap the desk top with a pencil. d) Hold the 30 cm ruler near to the ear and scratch the farther end. Let the ruler touch the ear and scratch the farther end.	Pencil, 30 cm ruler, polystyrene or plastic cups, string, scissors, aquarium /bucket water stones	Did pupils observe that sounds may travel through one or more medium to the receiver?	

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Unit 8: Energy: Forms of energy, their sources and effects

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
				<p>Sound travels in all directions; out to the side, down and up. Sound travels better and faster through solids and liquids than through the air.</p>	<p>(e) Make a string telephone using 2 polystyrene or plastic cups and about 30 m of string as follows: Make a hole in the bottom of each cup. Push the ends of the string through the holes and make knots. Speak into one cup and let another pupil listen through the other cup.</p> <p>(f) Use an aquarium if available or a bucket. Hit 2 small stones in the empty aquarium or bucket. Let another pupil put ears against the aquarium or bucket and listen. Is the sound louder than before? What has the sound passed through? In all of the above activities, pupils will observe that the sounds travel through one or more medium to the receiver.</p>			

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Unit 8: Energy: Forms of energy, their sources and effects

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
How we hear	Briefly and simply explain how the ear works for us to hear.	Observe from a model and or charts/ diagrams the main parts of the ear. Demonstrate simply (no details) how the ear works.		We hear sounds with our ears. Sound vibrations are collected by our ear-flaps and pass along the ear canal. These vibrations make the thin skin-like ear drum vibrate. The vibrations pass through the rest of the ear, that is, the middle ear to the inner ear, and messages are sent by nerves to the brain. The brain interprets the vibrations as sounds. All this happens very, very quickly.	<ol style="list-style-type: none"> 1. Teacher provides models, charts or diagrams of the structure of the ear. 2. Pupils observe model, charts or diagrams of the ear. 3. Teacher demonstrates and explains briefly how the ear works. (It would be better if the demonstration is done for each group of pupils). 	Model of the ear, charts/ diagrams of the ear.	Were pupils able to recognize the location and appearance of the delicate ear drum? Could pupils briefly explain how the ear works?	Health and Family Life Education - How the ear works.

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Unit 8: Energy: Forms of energy, their sources and effects

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
Care of the ears	Explain briefly why we should care our ears.		Foster the habit of using our ears properly and with care.	The ear and its parts are important. They can be cared for as follows: - Never push things in our ears as this can damage the ear drum and lead to deafness. - Hairs in the ear keep out dirt. The outer end of the ear canal can be cleaned by an oiled cotton swab or 'q-tip'. - Wax is produced in the ear canal to clean and moisten it. Excess wax can cause partial deafness or 'buzzing' in the ear and should be removed by a doctor or nurse. Avoid too loud sound as they can damage the ear drum and lead to deafness.	Pupils will work in small groups 1. They will discuss how they should care their ears. 2. Groups share their ideas during class discussion. 3. Teacher guides class in summarizing the main ways to care the ears. These could be placed on a poster and displayed in the class.	Model of the ear, charts/ diagrams of the ear	Did pupils suggest simple and practical ways to care their ears?	Health and Family Life Education - Care of the ears. Art and Craft-Making posters

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Unit 8: Energy: Forms of energy, their sources and effects

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
How we see	Briefly and simply explain how the eye works for us to see.	Observe from a model and or charts/ diagrams the main parts of the eye. Demonstrate simply (no details) how the eye works.		The eye is shaped like a ball. Light comes into the eye from an object. Without light we cannot see. The light passes through the part of the eye called the pupil . The light is focused by the lens onto the back of the eye to form an image. This image is sent along a nerve to the brain where it is interpreted and we see the object we are looking at.	<ol style="list-style-type: none"> 1. Teacher provides models, charts or diagrams of the structure of the eye. 2. Pupils observe model, charts or diagrams of the eye. 3. Teacher demonstrates and explains briefly how the eye works. (It would be better if the demonstration is done for each group of pupils.) 	Model of the eye, charts/ diagrams of the eye.	Were pupils able to recognize the main parts of the eye? Could pupils briefly explain how the eye works?	Health and Family Life - education How the eye works.

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Unit 8: Energy: Forms of energy, their sources and effects

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
Care of the eyes	Explain briefly why we should care our eyes. State some simple ways to care the eyes.		Foster the habit of using our eyes properly and with care.	Our eyes are very important. In caring them we should do the following - Never push things into the eye. - Never rub eyes with hands. - In very bright light, protect eyes with sunglasses. - wash eyes with clean water. - If you cannot see things clearly, have your eyes tested. - If you need to wear spectacles, then wear them.	<p>Pupils will work in small groups.</p> <ol style="list-style-type: none"> 1. They will discuss how they should care their eyes. 2. Groups share their ideas during class discussion. 3. Teacher guides class in summarizing the main ways to care the eyes. These could be placed on a poster and displayed in the class. 	Model of the eye, charts / diagrams of the eye	Did pupils suggest simple and practical ways to care their eyes?	Health and Family Life Education - Care of the eyes.

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Unit 8: Energy

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
Light travels faster than sound	State situations where light travels faster than sound.	Demonstrate that light travels faster than sound.		<p>- If eyes are red and itchy, go to the clinic or doctor. - Do not strain eyes by working in dim light. -Do not look at welding flashes or the sun. Light travels faster than sound. For example, we would see the light of an approaching vehicle before we hear the sound of its engine. Also, we would see lightning before we hear the thunder</p>	<p>1. Pupils suggest situations where they would see the light before they hear the sound.</p> <p>2. As a follow-up, class uses the playing field to show light travels faster than sound as follows: a) Activity should be done in school yard.</p>	Whistle, pocket kerchief	Were pupil able to say which they observe first, light or sound?	

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Unit 8: Energy - Forms of energy, their sources and effects

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
					<p>b) Longest possible distance is selected.</p> <p>c) At the starting point, one pupil blows a whistle and another waves a pocket kerchief at the same time.</p> <p>d) At the finish point, pupils say which they observe first the waving of the kerchief or sound of the whistle.</p>			

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Unit 9: Forces - Types of forces and their effects

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
Measuring forces	Convert mass to force (weight)	Measure the size of a force using a force measurer or spring balance. Measure mass of an object or body using a spring balance.		Forces are measured by force measurers or spring balances and are expressed in newtons (N). However, it is more common to have scales and balances that measure mass. The measured mass can then be converted to force (weight). A mass of 1 kilogram (kg) exerts a force of 10 newtons (N). Thus $1 \text{ kg} = 10 \text{ N}$.	Pupils will work in pairs or small groups. 1. Use a force measurer to measure the push or pull that is exerted on a body e.g. pull on a door knob, a book, or any other object. 2. Use scales or balances to measure the mass of different objects. 3. Convert mass into force (weight) by multiplying the mass in kg by 10 N.	Force measurer, scale, balance, assortment of common objects e.g. book, ball, rock.	Were pupils able to use the force measurer and read the measurements? Were pupils able to convert the measured masses into forces (weights)?	Mathematics- Using measuring devices.

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Effects of increasing and decreasing forces The effects of friction.	Explain briefly the effects of increasing and decreasing forces. Discuss the effects of friction.	Predict the effects of increasing and decreasing forces. Demonstrate the effects of increasing and decreasing forces. Investigate the effects of friction.	Display care in moving on smooth surfaces	Forces (pushes, pulls, twists and turns) make things go. An increase in forces can cause an increase in motion. Similarly, a decrease in forces would result in reduced motion and the body may even stop or come to a rest. Whenever one object moves over another, friction tries to stop the movement.	Pupils will work in small groups. 1. They will recap the effects of applying forces on objects such as pushing or pulling a book or box. 2. They can set up a see-saw using a 30 cm ruler and a pencil as a pivot. 3. They may use coins or similar objects and try to balance them on the see-saw. They could vary the quantity and position of the coins and observe the effects. 4. Class is divided into groups and get involved in tug-o-wars. Pupils will work individually, in pairs or in small groups. 1. To illustrate friction at work, they will do the following :	Book, box, 30 cm ruler, pencil, coins. Book, plastic, pieces of wood – polished, unpolished, sandpaper, ball marble	Did pupils make meaningful predictions of the effects of increasing and decreasing forces? Was the use of the simple improvised see-saw effective? Were pupils familiar with friction?	Physical Education - Use of the see-saw, tug-o war. Technology Education - The effects of friction.

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		Record observations and results		On a polished floor there is very little friction and so an object will move quickly along it and take longer before it stops. Friction will increase or decrease according to the roughness or smoothness of the objects. On a gravel road there is a lot of friction and an object will move along it slowly and stop more quickly due to friction. Friction can be reduced by polishing the surfaces, oiling or greasing and using rollers or ball bearings.	(a) Push a book on the surface of the desk. (b) Push the same book on a piece of plastic. (c) Rub together two pieces of unpolished board. (d) Rub together two pieces of smooth, polished board. (e) Rub together two pieces of sand paper. 2. Pupils note their observations and results and report same for class discussion. 3. Pupils carry out the following activities to illustrate some effects of friction a) Rub the palms of their hands together and note the effects.			

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				Friction is a very common force and it also helps in movement, for example, in the friction of tyres on the road, the friction of brakes on a wheel and of our footwear on the road or floor.	(b) Choose two surfaces, a smooth one such as a shiny book or piece of plastic and a rough one such as bumpy wood or piece of sand paper. Start a ball or marble moving gently on the smooth surface. How did it go and did it keep going? (c) Repeat b) ii above using the rough surface. Compare the observations and the results.			

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					4. Pupils will explain briefly the following situations:		What are brakes? How do we use them?	