

PRIMARY SCIENCE CURRICULUM GUIDE

GRADE 6

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					
The re-productive system.	Name the main parts of the male and female reproductive system.	Use diagram to identify the parts of the re-productive system.		The male reproductive system mainly consists of the penis and the testes . The female reproductive system consists of the vulva, vagina, uterus (womb) and ovaries .	1. Pupils look at charts or diagrams showing the main parts of the male and female reproductive system. 2. A list of the names of the parts of the reproductive systems is written on the board. 3. Pupils read words and identify any they have heard before. 4. Pupils give common, or colloquial, words used for the various parts. Explain that in the following lessons they will use the names given on the board. 5. (a) Two large diagrams of the male reproductive system are drawn on the board. (b) Class is divided into two teams. Give pupils from each team cards with the names of the parts on. (c) In turn, pupils place their cards on the diagram. (d) The first team to label the diagram correctly wins.	Cards with names of the parts of the re-productive system, tacks/tape.	Were pupils able to label the re-productive systems correctly? Do pupils help each other to label the large diagram? Did pupils use appropriate language for the parts of the re-productive system?	Health and Family Life Education - Re-production.

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Functions of the re-productive system.	Describe the process of re-production. Match the parts of the re-productive system to their functions.	Use diagrams to show how re-production takes place.	Appreciate the need for maturity before becoming sexually active. Appreciate the responsibilities associated with having children. Discuss the consequences of sexual intercourse.	Reproduction is the process of producing new life. In humans this happens through sexual intercourse . It is illegal to have sexual intercourse below the age of 16 years. A high level of maturity and responsibility should be reached before becoming sexually active.	6. Repeat the game using the female reproductive system. 7. They copy and label diagram in books. 1. In a teacher-directed, class discussion, pupils discuss how they think babies are made. Those who would like to report, do so to the class. 2. Large diagrams are drawn on the board of the female and the male reproductive systems. 3. Using large cardboard cut-outs of a sperm and an egg, individual pupils show on the diagrams the path taken by the sperm to reach the egg during reproduction. Teacher or classmates can give guidance. 4. Pupils copy the diagrams and use arrows to show the path taken by the sperm.	Cardboard cut-outs of sperm and egg.	Were pupils able to show the place where the sperm and egg are produced and the path taken by sperm in sexual intercourse? Did pupils match parts of the reproductive system to their functions?	Healthy and Family Life-Education Reproduction and Sexual Intercourse.

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			Develop the ability to make informed decisions concerning sexual intercourse.	During sexual intercourse a man inserts his penis into a woman's vagina. Sperm , which is made in the testes, is then released through the penis into the vagina and makes its way to the uterus. The sperm sometimes reaches an egg which is produced in the ovaries – when this happens the egg is fertilised and a new human starts to grow inside the uterus, which now becomes the womb.	5. Pupils suggest how the sperm gets into the vagina and define sexual intercourse in their own words. 6. In random order, the names of the parts of the reproductive systems and their functions are written on the board. Pupils match the names of the parts to their functions. 7. Class discuss briefly the need for maturity before becoming sexually active. Explain that condoms can prevent pregnancy but the only safe way to prevent pregnancy is not to have sexual intercourse at all.		Did pupils appreciate the need for maturity before becoming sexually active?	

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Maturity and Re-production.	State the consequences of sexual intercourse. Discuss the response-abilities associated with raising children. Discuss ways to prevent unwanted pregnancy.	Communicate through drama/stories.	Discuss the need for maturity before becoming sexually active. Explain the need to be a responsible adult before having children. Develop the ability to make informed decisions concerning sexual intercourse.	Before anyone has sexual intercourse he or she should be matured enough to make informed decisions for themselves. If a person has sexual intercourse before they are emotionally matured they may not protect themselves against unwanted pregnancy, AIDS and other transmitted diseases.	<i>This topic may take three lessons.</i> <u>Lesson 1</u> (a) Working in groups, pupils discuss why young people may become sexually active. (b) Class summaries group discussions. - Pupils compile guidelines which help young people abstain from sexual intercourse. (a) Pupils write letter to a friend explaining why they should not have sexual intercourse until they are older. (b) Class discusses reasons given in some of the letters. They decide which are good reasons.	Objects roughly the same size and mass of babies, e.g large bottle or water, bag of rice.	Did pupils give opinions about what they would do if given the opportunity to have sexual intercourse? Were pupils able to give reasons not to have sex until they are married? Were pupils able to list response-abilities associated with raising children?	Health and Family Life-Education Family, Human Sexuality. Drama/ Language Arts- Plays and stories, letter writing.

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				It is illegal to have sex under the age of 16. Sexual intercourse can lead to pregnancy and childbirth. There are many responsibilities associated with having children, these include, - showing love to the child. - Providing food, shelter, and medical treatment. - Providing social and academic education. Some ways of preventing pregnancy include, not having sexual intercourse, using contraceptives, such as pills and condoms.	<u>Lesson 2</u> 1. Pupils discuss and list the things you need to do in caring for babies and young children. 2. Pupils work in pairs (a few can work on their own). They are given an object roughly the same size and shape as a baby. They give their 'baby' a name. They must look after the 'baby' for one day and one night. 3. Pupils discuss their experiences in looking after the 'baby'. They compare these to experiences of looking after real babies. <u>Lesson 3</u> 1. Class discusses reasons for wanting to prevent pregnancy and decide which are valid. 2. They discuss ways to prevent pregnancy and list these in order of effectiveness.		Did pupils discuss the different methods of preventing pregnancy.	

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Sexually transmitted diseases.	Explain that some diseases can be contracted during sexual intercourse.	Research information STI's and STD's.	Appreciate that all people who have sexual intercourse are at risk of catching STD's.	<i>The only reliable way to prevent pregnancy is not to have sexual intercourse.</i> Some diseases are passed from one person to another such as <i>colds</i> and <i>malaria</i>. These are said to be <i>contagious</i> or <i>infectious</i> diseases. Some contagious diseases are spread from one person to another during sexual contact. These are known as sexually transmitted diseases (STD's).	1. Pupils are introduced to the concept of contagious disease by discussing disease they are aware of and how they are contracted. 2. Class demonstrates the spread of contagious diseases a) Two pupils are handed a box/bag containing both black and white beads/counters. They take out one bead then pass the box/bag to anyone they can reach without walking. b) The next pupil to receive the box/bag takes out one bead and passes it on. Repeat until the box/bags have been passed around most of the class. c) Pupils are informed that all those with black beads have the disease.	Box/Bag. Beads, counter or similar objects of two different colours Posters on STDs.	Were pupils able to explain how contagious diseases are spread? Were pupils able to state that sexual intercourse is one means of spreading disease? Could pupils list at least three STDs?	Health and Family Life-Education- Human sexuality, STIs, STDs.

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				Examples of these are AIDS (Acquired Immune-Deficiency Syndrome syphilis and herpes.	d) They discuss the results of the demonstration. 3. Pupils discuss the process of reproduction, focusing on physical contact and the exchange of body fluids (e.g. sperm, blood). They relate this to the spread of STDs. 4. Pupils fill in the gaps to complete sentences describing how STD's are contracted. 5. From a list of diseases, pupils decide which are contagious and of these, which are STDs.			

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How AIDS is contracted.	Explain how a person can become infected with the AIDS virus. Discuss the general effects of AIDS.	Researching and Reporting facts about AIDS.	Appreciate that anyone who is sexually active, or shares syringes to inject drugs, is at risk of catching AIDS.	How AIDS is contracted – 1. Before AIDS develops the HIV virus must enter the body. The HIV virus is carried in the <i>blood, semen and vaginal fluid</i> of infected persons. If any of these liquids from an infected person passes into your blood, you can become infected with the HIV virus. This can happen if you have sex with an infected person, if you use a needle or syringe to inject drugs into your body after an infected person has use the same needle or syringe. You cannot get the	1. Pupils discuss their ideas about HIV and AIDS, focusing on what they think AIDS/HIV is and how it is contracted. 2. a) Statements concerning ways by which AIDS can be contracted are written on the board, or on slips of paper for group work. These should include common misunderstandings e.g <i>AIDS can be caught from kissing</i>, as well as true statement. b) Class discusses each statement. 3. a) Pupils are given slips of paper describing steps in the contraction of AIDS. b) In groups they decide in which order the steps should go. c) Groups report how they ordered the statements and discuss. 4. a) Pupils are given folded slips of paper with one of the following written inside.			

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				HIV virus from kissing, touching, toilet seats, or clothes. 2. The HIV virus attacks the body until it cannot fight against diseases.	- HIV + - AIDS - NO DISEASE b) Several pupils are given the slips of paper with the word 'condom' written on them. c) Pupils note what they have on their paper without showing others. d) They exchange paper with a friend. e) Those who at any stage received paper with HIV + or AIDS stand up. These were at risk of getting AIDS. f) Of those standing, the ones with 'condom' written on the paper can sit down as they were given some protection. g) Pupils discuss activity and relate it to how AIDS is contracted.			

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How to prevent AIDS.	Explain how to prevent AIDS	Differentiate between appropriate and inappropriate behaviour among adolescents.	Discuss why people put themselves at risk of AIDS. Develop the ability to make informed decisions about sexual behaviour.	Some ways to prevent HIV/AIDS are as follows, Persons should - not have sex with infected persons. - have sex with one partner, ensure the partner is not infected. - If you have use a condom, remember: (No Sex is Safe Sex.) - Not to share needles or syringes used for injections.	- Pupils recall the ways by which AIDS can be contracted. - Pupils are provided with statements concerning ways to prevent AIDS. These should include false ideas and common misunderstandings. - In groups they classified these statements as 'safe' or 'unsafe'. Groups share ideas with class. - Working in groups, pupils discuss what they think is the best way to prevent AIDS, giving reasons. - Class discusses why people often put themselves at risk of getting AIDS. - Groups share their observations during class discussion. NOTE: Teachers must ensure that pupils do not develop wrong concepts and attitudes.	Posters on AIDS and its prevention, Videos on AIDS.	Were pupils able to explain how to prevent HIV and AIDS? Did pupils demonstrate how to make the correct decisions concerning sexual behaviour?	Health and Family Life Education – STDs. Drama-role playing.

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Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
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The effects of AIDS.	Describe the physical effects of AIDS on the body. Discuss the emotional and psychological effects of AIDS.	Communicate feelings of compassion.	Recognise the serious emotional effects of AIDS on individuals, families and communities Display care and compassion for those with HIV and AIDS.	HIV is a virus which attacks the body's defence against diseases. When the virus defences a person is said to have AIDS. When other disease such as colds and other common infections attack the body one can no longer fight them. Eventually one of these diseases will cause the death of the person. Persons with AIDS usually know they are going to die; this makes them feel sad. It also make their families and friends sad and sometimes angry. People with HIV or AIDS often find it hard to get work and make friends because other people are scared they will catch AIDS from them. It is important to treat AIDS victims with respect.	1. Pupils discuss what they think AIDS does to the body. Ideas are out on the board. 2. Pupils write a list of the things they would do if they were told they had HIV/AIDS. 3. Pupils write a letter to an imaginary friend or relative with HIV/AIDS. They should give them good advice and try to make them happier. 4. Pupils discuss how AIDS could affect members of their family or their community.	Pictures of AIDS victims.	Were pupils able to describe the effects of AIDS on the body, the family and the community? Were pupils able to describe how they feel if they caught HIV/AIDS? Did pupils express concern for those with HIV/AIDS?	

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Unit 2: Animal Kingdom – The variety, features and life processes of animals.

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
Naming and grouping animals.	Recall the vertebrate and invertebrates group.	Use keys to identify animals from different groups and to classify them.	Develop respect for animal life.	Animals are grouped according to features they have in common. Identification keys can be used to name animals or to find out which group a known animal belong to.	Note: See page 12 and 13, Science Around Us, Book 4 for identification keys. 1. Pupils recall the various groups of animals, giving examples from each group. 2. Pupils work in groups. Each group is given a collection of animals (in pictures, models or samples.) 3. They use key to find out which group each animal belong to. 4. Pupils copy keys into books and record which groups their animals belong to.	Science Around Us, Book 4 pages 12 and 13. Identification keys pictures of animals / samples of animals/ Models of animals.	Were pupils able to use the identification keys to place animals into groups?	Mathematics Sets.
Animals and their environment	State the effects of animals in humans and the environment.	Research and display information.	Demonstrate appreciation for the role of animals. Display respect for animals.	Some of the effects animals have on humans are to, provide food, protection, and help with work. They also spread disease and damage food crops.	1. Pupils list the ways animals affect humans and the environment under the headings, 'Good Effects' and 'Bad Effects.'	Books, magazines, stories or IT resources, containing information about the effects of animals on humans	Did pupils list good and bad effects of animals on human and the environment ?	Agricultural Science Farm Animals.

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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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				Animals affect their environment in many ways such as feeding, making homes, and excreting waste.	<u>Project One</u> 2. Pupils work in groups to research, record and present information about how an animal, or a group of animals, affects man. For example, 'Pest', Pupils find out how they affect us, how to prevent them, etc. Or, 'Cattle', they could research how cattle provide food, clothing, labour, etc. <u>Project Two</u> 3. As per <i>Project One</i>, pupils work in groups to research, record and display information about how animals affect the environment.	and the environment Paper, cardboard, scissors, glue, colour markers / pencils.	Did pupils display information in an interesting way? Did pupils share tasks and activities in completing projects?	Art and Craft – Line drawing.

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Unit 3: Plant Kingdom – The variety, features and life processes of plant.

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
Parts of a flower.	Identify the main parts of a flower.	Observe the main parts of a flower. Draw and label a flower.	Display care and respect for a plant life.	The main parts of a flower are the stalk, sepals, petals, stamen, (male part) and carpels or pistil (female part). The sepals look leaf-like while the petals are usually large colourful parts. The stamen is made up of the anther (pollen sac) on the filament. The carpel or pistil is made up of the stigma, style and ovary.	1. a) Pupils bring flowers to classroom. <i>Note: When collecting flowers they should not pull up the whole plant and remove only a few flowers from one plant.</i> 2. a) Pupils examine flower specimens, identify floral parts and note their arrangement. b) They remove floral parts starting with the outer-most sepals. c) They cut flower in half along the stalk down to the stigma. Note arrangement of floral parts. d) Pupils make simple drawing of the whole flower and half-flower, labelling the main parts.	Flowers, razor blades, Science Around Us, Book 5, Page 58.	Did pupils draw and label a flower? Did pupils show respect for plants when collecting flowers?	Art and Craft- Line drawing.

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Unit 3: Plant Kingdom – The variety, features and life processes of plant.

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
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Pollination	Demonstrate the role of the anther and stigma in pollination.	Observe the parts of a flower.	Display care and respect for needs of plants.	The anther of the stamen (male part of the flower) produces pollen. The transfer of pollen to the stigma of the carpel or pistil (female parts of the flower) is called pollination.	- Pupils recall in class discussion that plants are living things, stating the characteristics of living things. Highlight reproduction as one of these characteristics. - Using two large diagrams on the board, individual pupils show how pollination occurs with guidance from teacher/classmates. - Using flowers brought to class; pupils pollinate each other's flowers. - They describe how they did this using the words 'stamen', 'stigma' and 'pollen.' - From two lists on the board pupils match the parts of the flower to their functions.	Flowers Diagrams of flowers.	Were pupils able to identify and name the male and female parts of the flower and give their functions? Did pupils demonstrate how pollination occurs? Were pupils able to use the correct terms for the parts of a flower?	Agricultural Science – Pollination of crops.

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Unit 3: Plant Kingdom – The variety, features and life processes of plant.

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
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Insert pollination	Describe the role of insects in pollination.	Observe insect activity.	Show willingness to share work with others.	Insects visit flowers to get nectar from them. When an insect visits a flower pollen from the anther sticks to its body. When the insect goes to another flower the pollen falls of the insect onto the stigma. Flowers have nectar that attracts insects. Some have sweet smells and brightly coloured petals.	<i>This topic may take two or three lessons.</i> - Pupils recall the process of pollination. - Pupils work in small groups to conduct the following investigation: <i>Which plants attract more insects?</i> - Pupils observe several (2 to 4) different plants and record descriptions of them regarding presence, size, smell and colour of petals. - They predict which flower will attract most insects. - They watch each plant for a fix time. (e.g. 10 minutes) – working in groups they can divide tasks so that one pupils watches each plant. - They record the number of insects that visit each plant in the agreed time and display results in tables and graphs.	Flowering plants for pupils to observe. These could be growing in the school yard or grown in pots. It is important to have some plants with bright /scented petals, and some without.	Did pupils accurately record the number of insects that went to each plant? Were pupils able to state which plants attracted most insects and suggest plausible reasons why? Were pupils able to explain the role of insects and petals in pollination?	Mathematics Graphs School Yard Ecology – Plants
	Explain how flowers attract insects.	Record insect activity. Record observations in tables and graphs. Interpret results of investigations.	Display safety precautions when around certain insects e.g. bees.					

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Unit 3: Plant Kingdom – The variety, features and life processes of plant.

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
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Wind pollination	Demonstrate the role of wind in pollination. Relate the structure of the stamen to pollination	Observe stamen with respect to methods of pollination. Draw and label a flower.	Display care and respect for plants.	In wind pollinated plants the stamens are large and hang out of the flower. They produce lots of light pollen grains. The wind blows pollen off the anther and onto the stigma.	e) They interpret the results stating which plants attracted most insects and suggest reasons why. 1. Using a sample of a wind pollination plant pupils demonstrate how pollen is blown off the anthers of one flower and finds its way onto the stigma of the same or another flower of the same kind. 2. Through discussion pupils relate the structure and size of the stamens and pollen to the use of wind in dispersal of pollen. 3. Pupils draw and label the flower of a wind-pollinated plant.	Wind-pollinated plants such as grasses.	Did pupils share tasks when working in groups? Were pupils able to relate the structure of the flower to the method of pollination? Did pupils draw and label a flower?	

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Fertilisation – fruits and seeds.	Discussion the processes of fertilisation.	Observe the main parts of fruits and seeds. Make simple drawings of fruits and seeds.		After pollination, the pollen grain grows down the style and fuses with the ovule on the ovary. This process is called fertilisation . The ovule develops into a seed and the ovary becomes a fruits. Many fruits are fleshy and have skins. The seed is usually inside the fruit.	1. a) Class discussion what happens after pollination and is introduced to the term <i>fertilisation</i> . b) On a diagram of flower pupils show the path taken by pollen to fertilise the egg in the ovary. 2. Pupils cut fruits in half transversely and longitudinally and examine to observe the main parts. 3. They make simple drawings of fruits and seed and label these.	Seeds and fruits Knife Large drawing of flower with parts labelled. Science Around US Pages 70-74	Did pupils draw a diagram to show what happens in fertilisation? Were pupils able to identify parts of a fruit?	Agricultural Science – Fruits and seeds.

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Fruits and seed dispersal.	Explain why seeds are dispersed. Compare the methods of dispersal of different seeds. Explain how a fruit and seed are formed.	Observe characteristics of fruits and seeds with respect to dispersal. Make prediction about seed dispersal. Record observation		Seedling must grow away from parent plant so they do not have to compete for light, nutrients and water. Some fruits are tasty so animals will eat them and carry away the seeds in faeces. Some fruits are light and are blown away by the wind while other fruits that float are dispersed by water. Animals, wind and water are called agents of dispersal.	- Pupils recall what seeds need to germinate and what plants need in order to live and grow. - They observe the ground under a tree and note the amount of light and water. - They discuss reasons why this is not a good place for plants to grow and relate this to the need for seeds to be scattered away from their parent plant. - Working in small groups, pupils observe a variety of seeds and their fruits and the features that allow them to be dispersed by man, animals, wind and water. Pupils record their predictions in a table. - Where possible, pupils demonstrate how the seeds may be dispersed.	Seeds / fruits that are dispersed by various methods including wind, as food for animals, floating in water and bursting open.	Were pupils able to explain why seeds must be dispersed? Did pupils observe fruits and seeds of various plants? Were pupils able to relate the structure of the fruits / seed to its method of dispersal?	Agricultural Science – Fertilisation. Germination

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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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Adaptation	Relate the adaptations of animals and plants to their surroundings. Compare the adaptations of animals and plants to different surroundings.	Observe animals and plants in several habitats with respect to adaptation Record features. Interpret observation.	Display respect for plants and animal life	Two of the main concerns of plants and animals are getting enough food (through sunlight and water in the case of plants) and avoiding being eaten or in danger. Different habitats present different opportunities for feeding and acquiring food. Animals and plants have features that equip them for finding food and avoiding predators in a particular habitat. These are called adaptation.	- Class recalls life processes of living things focusing on feeding. - Pupils observe pictures or samples of various animals. They state what the animal eats and where it lives. Pupils suggest how animal's body and skills make it suited to eating such food and living in such a place. - Pupils observe the adaptive features of animals in two different habitats and record these in separate tables. - Pupils relate the adaptive features to the conditions present in the habitat, e.g. the heron has long legs to help it wade in watery places. a) Pupils choose two animals, e.g. a mammal and an insect each from a different environment.	Science Around Us, Book 6, pages 1-10. Access to two different habitats e.g. trench and school yard or pasture and forest.	Did pupils observe the adaptation of various animals and plants? Were pupils able to relate the adaptive features of animals and plants to the condition present in their habitats? Were pupils able to compare the adaptations of two animals from different habitats?	School Yard Ecology Adaptations of plants and animals.

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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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Animals and plants of the rainforest	Identify animals and plants found in the rainforest.	Draw a plant or animal found in the rainforest.	Demonstrate interest in plants and animals of the rainforest.	A wide variety of trees and other plants make up the rainforest. Some plants are greenheart, purple heart and orchids. Many animals such as the jaguar, labba, monkey, eagle and arapaima live in the rainforest.	b) They compare the differences between the animals which relate to their adaptive features, e.g. compare a duck with parrot. 6. They observe plants in two habitats and record their features in separate tables. They discuss the adaptive features. 1. Pupils describe the rainforest using their imagination, or what they have learnt from books, pictures, television or visits. 2. Pupils observe specimens, pictures and other media relating to the rainforest. If possible visit the zoo, museum or area of rainforest where pupils can identify and draw plants and animals. 3. Pupils write questions for a quiz based on plants and animals of the rainforest.	Pictures, leaflets, magazines, videos, resource personnel giving information about the rainforest and its inhabitants.	Were pupils able to identify plants and animals which are found in the rainforest? Did pupils find out interesting information about a plant or animal?	Environmental Education – The rainforest

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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 importance of the rainforest	Discuss the importance of the rainforest.	Observe pictures of the rainforest	Develop interest in preserving nature.	The rainforest is important because it provides a home for many plants and animals. The trees in the rainforest use up carbon dioxide and release oxygen in the air. This is important for all life on Earth. Plants and animals in the rainforest provide food, shelter and medicine for humans.	4. Project a) Working in groups, pupils find out about a given plant or animal (size, feeding habits, place in a food chain, etc.) b) They display and present the information they found.	Information about rainforests in leaflets, magazine, books, news-papers, IT and resource personnel, paper, cardboard, scissors, glue, markers / paint.	Did pupils' poster / leaflets explain the importance of the rainforest? Did pupils explain to others the need to preserve the rainforest?	En-vironmental Education – Preserving habitats. Art and Craft – Making posters.
	Explain the need to preserve the rainforest.	Prepare posters on the rainforest			1. Pupils work in groups and discuss the importance of the rainforest. 2. Pupils prepare a leaflet or poster showing some of the reasons why the rainforest is important and to make people aware of the need to use its resources wisely. 3. Pupils display posters around the school or give leaflets to family and friends.			

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Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
Humans and the rainforest	Discuss the effects of humans on rainforest.	Record and display ways in which humans affect the rainforest. Reporting on a project.	Demonstrate willingness to work toward better use of the rainforest by humans.	We need to use the rainforest resources wisely and in small amounts or the rainforest will be destroyed and eventually vanished. Humans affect the rainforest in many ways, for example, by cutting down trees for wood, grazing by animals, building roads, hunting and mining.	4. Pupils explain to family and friends the importance of the rainforest and the need to preserve it. Note: <i>This work could be incorporated into the project in the following topic, see below.</i> Project <u>The Rainforest and Us</u> 1. Using information from sources such as the media, magazine, videos, museums and Iwokrama, pupils research and present information concerning man's effects on the rainforest. The project should take the form of a problem/question, such as, "How do humans affect the rainforest, and how can we help preserve it?" The project should conclude with useful solutions/answers.	Information about rainforests in leaflets, magazine, books, newspapers, IT and resource personnel.	Did pupils' projects show how the effects of humans on the rainforest?	Language Arts- writing factual information for leaflets. Environmental Education – Preserving Habitats. Art – Drawings / collage in projects.

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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					
				Humans burn fuels like methane, gas, petrol and diesel. This pollutes the air and damages the rainforest by making less pollution and using rainforest products wisely. This creates a better environment for trees and animals to live in.	2. Pupils present their project to the class and invite guests. The presentation should include pictures, tables, and graphs. NOTE: <i>This project could incorporate work on the importance of the rainforest, see above.</i>	Paper, cardboard, scissors, glue, markers / paint.	Were pupils able to suggest how humans can help preserve the rainforest?	Language Arts- Reading for information and oral presentation.

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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					
Sources of water and uses of water.	Identify some sources of water. Identify some uses of water. Discuss ways by which water can be purified. Explain why water must be used wisely or conserved.	Research, record and display information in tables / graphs. Manipulate equipment and materials in purifying water.	Demonstrate wise use of water. Develop the habit of drinking purified water.	Water comes from many sources, such as rain, rivers, lakes, seas, trenches, and wells. Water can be purified by boiling, filtering, settling and adding chlorine / bleach. Uses of water include washing, drinking, transportation, swimming / recreation and industrial uses such as mining.	Project: Water Pupils research and present information about water. This should be in the form of writing, pictures, tables, graphs and diagrams. The following are some suggested headings and activities for the project. <i>Where We Get Water From?</i> Pupils conduct a survey of the ways water is used in their home / community. <i>Water Is Used For</i> Pupils conduct a survey of the ways water is used in their homes / community. <i>Wastage Of Water</i> Pupils observe and record activities / places with ways to prevent wastage.	Information about water in magazines, news (papers, books, IT and videos, paper, cardboard, markers, paint, scissors, glue, tape, Large container of water, cups, Dripping pipe, container, Means of measuring volume – beaker / measuring jug.	Was information in projects in a clear and interesting way? Did pupils record sources and uses of water in their homes / community? Were pupils able to suggest valid ways to prevent wastage of water?	Mathematics – Multiplication, graphs. Art – drawings, collage. Environmental education / Social Studies – Conservation and use of water.

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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					
					<i>Why Save Water?</i> A. 1. Pass a large bottle of water around the class, asking each pupil to pour themselves a drink. Make sure the bottle does not have enough for all pupils. 2. Ask pupils who did not get a drink how they feel. 3. Repeat the exercise on another day using the same amount of water. Start with pupils who got none last time. This time you want all pupils to get a drink. 4. Discuss whether pupils should be allowed to take as much as they want, and how this can be applied to water use at home and in the community.	Water, heat source and metal container, bleach, filtration equipment.	Were pupils able to use suggested methods of water purification?	

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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					
					B. 1. Pupils leave a pipe dripping slowly into a large container for 24 hours and measure how much water is wasted. 2. They calculate how much water would be wasted in this manner over one month / one year. <i>Safe Water</i> 1. Teacher introduces pupils to the various ways to make water safe to drink. 2. Pupils practise water purification methods and write instructions. 3. Pupils write leaflets / posters about the need to use safe water and how to make water safe.			

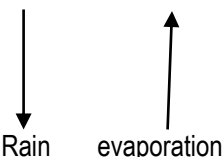
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Unit 5: Weather – Types, features and effects of the weather.

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
The Water Cycle	Briefly explain how the water cycle works.	Observe the process involved in the water cycle. Represent the water cycle in a diagram.		The water cycle is the movement of water on the Earth and in the atmosphere. Rain falls on the land and runs into rivers, lakes and seas. Some of this water is absorbed into the earth or used by plants and animals. The sun causes water to evaporate from plants, animals, rivers, lakes and seas and rise into the air as water vapour. The water vapour condenses to form small droplets which group together as clouds. The droplets then fall from the clouds as rain.	- Pupils list all the places they can think of where is found (encourage them to think of water in plants and animals as well as more obvious places.) - Pupils state ways in which water moves between these places, i.e. it moves between rivers and animals when animals drink. - Demonstrate evaporation by heating water and observing water vapour, or by leaving water in trays in the sun. Demonstrate condensation using tin can / glass of ice and observing that water droplets on the surface of the tin can / glass. Compare to boiling water in the kitchen. - Demonstrate rain by allowing the droplets that form in the glass to run together and fall.	Water, trays, tins, heat source (candle, kerosene burner), ice, glass / tin.	Did pupils observe the different stages of the water cycle? Were pupils able to demonstrate the processes involved in the water cycle?	Environmental Education and Social Studies – The Water Cycle.

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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					
				Clouds ← Vapour  Rain evaporation Water (in rivers, seas, etc.)	4. Pupils look out of the classroom and try to say where these processes might occur. 5. On a diagram showing the land, sea, plant, animals and clouds pupils use arrows to show the direction in which water moves. They label the diagram and try to explain what happens at each stage, e.g. 'Water falls from the clouds as rain. Rain runs into rivers, etc.			

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PRIMARY SCIENCE CURRICULUM GUIDE GRADE 6

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

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
Sep- arating mixtures and solutions.	Demonstrate two methods by which mixtures and solutions can be separated.	Manipulate equipment and materials in separating mixtures. Observe the process of evaporation and chromatography. Record observations	Demonstrate care and safety in handling equipments.	Solutions and mixtures involving liquids can be separated evaporation and chromatography . Evaporation takes place when liquid is heated and turns into gas. When two liquids are mixed and heated one liquid will evaporate first leaving the other liquid behind. Heating liquid with solid dissolved in it, such as salt water, will turn to the liquid into gas separating it from the solid which will be left behind.	<i>Investigation: How can sand and salt be separated?</i> 1. In groups pupils are given a mixture of mixture of salt and sand. They give ideas about how the salt can be separated from the salt. <i>Note: Where possible, try some of the pupils ideas.</i> 2. Pupils put sand and salt mixture in water and stir it. 3. They filter the sand from the water (using a plastic bag with holes in the bottom corner) and collect the water. 4. They evaporated the water using the sun, a candle, or stove. This leaves the salt in the container. 5. They draw diagrams of the equipment and record observations.	Sand, Salt, water, containers, tins, candle / stove, filter (can be made a small plastic bag with pinholes in one corner, water-soluble ink / dye / paint, absorbent paper (tissue paper, filter paper, etc.)	Were pupils able to observe and record the processes involved in separating sand from salt? Did pupils demonstrate safety in handling equipment? Did pupils explain what happened to the ink / dye in their own words?	Art and Craft – Colour pattern. Food and Nutrition – cooking and preservation of food.

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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					
				Two liquids of different colours can be separated by chromatography – Put a dot of mixed liquids onto a strip of absorbent paper, place the strip into water or alcohol. As the water or alcohol is absorbed it moves up the paper, the colour becomes dissolved in the water/alcohol and moves with it. Different colour inks/ dyes will travel different distances up the paper.	Investigation: Which colours make up purple (or any colour)? - Pupils make patterns by putting ink / dye / paint on absorbent paper then allowing water to soak the paper and move the colours. - Pupils draw a dot of coloured ink near one end of a strip of absorbent paper. - Place the same end of the paper on water. The ink must NOT be below the water. - Pupils observe what happens over five minutes. - They draw a diagram of the equipment and explain what happened <i>in their own words</i>.			

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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					
Materials and their uses.	Relate the common physical properties of matters to their uses.			Materials have different physical properties and are used in different ways. What a particular material is used for depends on these properties. For example, <i>iron</i> is hard, strong, and conducts heat , it is used to make pans, tools, engine parts and gates. <i>Rubber</i> is soft, water-resistant, flexible and light, it does not conduct electricity . It is used as grips for tools, boots, condoms, bicycle tubes and balloons.	1. Pupils observe various materials, preferable on an unprocessed form. They list the physical properties of these. 2. Following discussion pupils list the uses of each materials. 3. Project a) Pupils design something useful. For example a car, space suite, Mashramani float/costumes or new cricket gears. They should be encouraged to choose something which involves different types of materials. b) Pupils state what materials they would use to make the item they designed and explain why. For example, lead is heavy so it is used in the boots of a space suit to stop the wearer bouncing high on the moon.	Various materials such as metals, wood, plastic and textiles.	Were pupils able to list appropriate uses for materials? In their designs, did pupils choose appropriate materials for each job?	Technology Education – Materials Design. Art and craft - design

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PRIMARY SCIENCE CURRICULUM GUIDE **GRADE 6**

Unit 7: Earth and Space – Components of the Solar System and their interrelations.

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
Satellite	Discuss the relationship between the Earth and the Moon as its Satellite. State the use of mandate satellite.			The moon is in orbit around the Earth therefore it is called a satellite. It takes the moon one lunar month (28 days) to go around the Earth. It is kept in orbit by the pull of the Earth's gravity. Man-made satellites are items of technology deliberately placed into orbit around the Earth. Some of the uses of satellites are to give us pictures of the Earth's surface, clouds so we can predict the weather and to transfer communication signals such as those used by telephone and televisions.	- Class discusses the thing they can see in the sky, and the things they know are in space. Focus attention on the moon and other satellites. - Pupils research and present information about satellite using diagrams, pictures and oral presentation. They should include information on the following: - The Moon - Effects if the moon - Uses of man-made satellite	Sources of information such as books, magazines news-papers and IT resources, scissors, glue, paper, cardboard, markers.	Did pupils' project state the relationship between the Earth and the moon? Did projects provide information about the uses of man-made satellite?	Social Studies – The Moon

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PRIMARY SCIENCE CURRICULUM GUIDE

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Unit 7: Earth and Space – Components of the Solar System and their interrelations.

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
Eclipses	Demonstrate how eclipses of the moon and sun occur.	Manipulate materials to illustrate eclipse.		An eclipse of the sun occurs when the moon is between the Earth and the sun, blocking out the light from the sun. An eclipse of the moon occurs when the Earth's is between the sun and the moon. This stops light from the sun reaching the moon, making the moon go dark.	- Pupils recall that light travels in straight lines and discuss how shadows are formed. - Pupils demonstrate an eclipse of the sun - They make a moon cutting out a circle of cardboard and pasting on some shiny material. - In a dark place, using a torch light as the sun they slowly move the 'moon' across the 'sun'. - They report their observations. - Pupils demonstrate an eclipse of the moon. - They make an Earth out of a cardboard circle. - They shine the torch light (sun) onto the shiny surface of the 'moon'. - They slowly move the 'Earth' in between the 'sun' and the light shining on the moon. - They reported their observations. - Pupils draw diagrams of an eclipse of the moon and of the sun.	Cardboard, scissors, torch, tape, paste, shiny material such as aluminium foil.	Were pupils able to demonstrate eclipses using the materials provided? Did pupils draw diagrams of eclipses?	Social Studies – Eclipses.

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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					
Electricity	Explain the relationship between the number of batteries in a circle and the brightness of a bulb.	Manipulate materials to set up electrical circuits. Explore and observe the effects of changing the number of batteries in a circuit. Interpret results of an investigation.		Batteries are stores of energy. When they are connected to an electrical energy they can do things such as lighting bulbs. The more batteries there are in a circuit, the more electrical energy is released. Therefore, the more batteries there are the brighter the light bulb will be.	- Pupils recall that electricity only flows in a complete circuit and name the components of an electrical circuit. - Working in groups, pupils investigate how the number of batteries in a circuit effects the brightness of a bulb. - They predict what happen when they change the number of bulbs. - They set up circuits with one, two then three batteries. - They observe and record the brightness of the bulb in each circuit. - From the result they conclude on the effects of changing the number of batteries in a circuit.	Light bulb (2.5 v torch light bulbs), Wires, batteries, tape, cardboard.	Were pupils able to observe different levels of brightness in the bulb? Were pupils able to explain the relationship between the number of batteries and the brightness of a bulb?	Technology Education – Electricity.

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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					
Energy changes	Identify how energy changes from one form to another.	Observe energy changes. Manipulate equipment in demonstrating energy changes.		Energy cannot be created or destroyed. Energy can be from one form to another, for example, when a lighted bulb is switched in electrical energy is changed into light and heat energy. Energy changes can be represented in diagrams, for example. <pre> graph TD A[Electrical (in battery)] --> B[Light (in light bulb)] A --> C[Heat] </pre>	- Pupils recall the different forms of energy and give examples of where they are found. - In pairs, pupils make cotton reel racer (see Materials). - They investigate how the number of times they twist the rubber band effects how far the racer will go. - Twist the band say 10 times and release the racer, repeat with 15, 20, and 25 twists. - On each occasion measure and record the distance travelled. - Pupils discuss and interpret results. - Class discusses the types of energy observed in using the racer. - They make an energy change. - Under supervision, pupils demonstrate energy changes using interesting examples, e.g. inflating and releasing a balloon, using toys and electrical appliances, cooking.	Cotton reel racer: Cotton reel, rubber band, matches. Thread the rubber band through the cotton reel. Place a match stick through the loop of the rubber band on one side of the cotton reel. Put a small piece of match stick through the band on the other side.	Did pupils make and use cotton reel racer? Were pupils able to identify the types of energy present in demonstrations activities? Did pupils draw at least three diagrams to show energy changes?	Technology Education – Energy transfer. Mathematics – Measuring distance.

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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					
Alternative energy source	Identify and discuss renewable energy sources.	Observe differences between re-newable and non-re-newable energy sources.	Demonstrate willingness to use energy wisely. Discuss the importance of using re-newable energy.	Non-renewable Energy sources are those which cannot be refused or replaced such as <i>oil, gas, wood</i> and <i>coal</i>. These sources are those which cannot be replaced or reused such as <i>wind, rivers, waves, and the sun</i>. Renewable energy sources do not pollute the Earth.	7. They draw energy change diagrams for these example. 1. Pupils compare heating water in the sun with heating water using a fuel such as wood or kerosene. 2. They list the advantages and disadvantages of each method. 3. Project a) Pupils work in groups. Each group is allocated one type of renewable energy. b) They find information about this energy source. c) They present this information to the class and invited guests. d) Where possible, they should use demonstrations, posters, tables / graphs.	Turn the match stick to twist the rubber band. Release on a flat surface. Tins, water. Fuel, cardboard, scissors, glue, markers, paper. Sources of in-formation such as books, magazines and IT resources.	Were pupils able to discuss the importance of renewable energy? Did projects show interesting information about renewable energy?	Environment Educational Energy sources. Mathematics – tables and graphs.

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

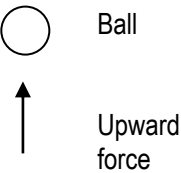
Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
Wise use of energy.	Identify ways in which energy can be used wisely.	Observe energy conservation practices in the home or community	Demonstrate state wise use of energy in school and at home. Explain the importance of conserving energy.	It is important to conserve energy, or use it wisely because many energy sources could run out and using them causes harm to the Earth in the form of pollution. Energy can be used wisely in many ways, such as: - Switching off lights bulbs and electrical appliances when not in use. - Walking or cycling instead of using cars/buses. - Reusing bottles and other containers instead of producing new ones.	1. Relating to previous work on non-renewable energy sources, pupils discuss the need to conserve energy. 2. Pupils observe pictures of household and industrial scenes. In each scene, they identify areas where energy can be wasted and where it can be used more wisely. 3. Pupils discuss and list ways they can use energy wisely at home and in school. <i>Homework:</i> Pupils identify where they can use energy more wisely at home.	Pictures of household / industrial and everyday scenes.	Did pupils demonstrate wise use of energy at home and in schools? Were pupils able to list five ways to conserve energy?	Environmental Education – Energy used.

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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					
Direction of forces	Identify directions in which forces act.	Observe forces and the directions in which they act. Draw diagrams to show the direction of forces.		Forces act in different directions. For example, a push can be in an upward, downward or sideways direction. The direction of a force can be shown on a diagram using an arrow. For example when throwing a ball into the air the thrower pushed the ball up. The force (or push) is in an upward direction and can be represented thus,  This is a force diagram.	- Pupils recall the different types of forces, giving examples. - They recall the effects of forces on objects. - Pupils participate in games and activities which involve interesting use of forces (see Materials). - They observe and identify forces used/present in the activities, stating the direction of the forces. a) They choose one activity and draw it. b) On the drawing they draw an arrow to show the direction of the force.	Games, activities and models which will stimulate interest and curiosity, e.g. jacks, tug-o-war, magnets, toy car, kites, windmills.	Did pupils experience forces while doing activities? Were pupils able to identify the direction of forces? Could pupils represent the direction of forces in diagram?	Physical Education – Use of forces in sports and games. Technology Education – Forces. Art and Craft Drawings.

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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					
Machines – The Screw and Wedge	Demonstrate how the screw and wedge make work easier.	Observe the use of the screw and wedge.		The wedge, sharp things like <i>axes</i> and <i>knives</i> are examples of wedges. The point of the wedge is the sharp part of a knife. The wedge is used to cut or split things. The wedge is made up of cut or split things. The wedge is made up of two inclined planes. The screw Examples of screws are <i>bottles, tops, screws, and jacks</i>. When you turn it, it makes work easier, for example, a small jack can raise a heavy vehicle. The screw is an incline plane wrapped around a cylinder.	1. Pupils demonstrate how the wedge makes work easier by trying to cut something with a blunt knife then with a sharp knife (exercise caution). 2. Pupils demonstrate how the screw makes work easier, for example by using a jack to lift a heavy object. 3. Pupils draw diagrams showing the use of screws and wedges.	<i>Ref. Science Around Us – Book 5, Pages 132 – 138.</i> Examples of wedges and screws.	Were pupils able to demonstrate how screws and wedges make work easier? Did pupils' diagram show how wedges and screws work?	Technology Education – Machines Art and Craft – drawing.

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Unit 9: Forces – Types of forces and their effects.

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
Machines	Demonstrate the uses of some simple machines.	Observe simple machines in use.		Simple machines include pulleys, levers, wheels, inclined planes, screws and wedges. They all make work easier by allowing us to create a large force using a small one.	1. Pupils demonstrate the use of pulleys, levers, wheels and inclined planes. 2. They draw force diagrams to show the uses of each machine. 3. Pupils are given various tasks to complete (real life or imaginary). 4. They suggest (and where possible, use) the best machine for each task. Examples of tasks are, opening milk tins, getting a heavy oil drum onto a truck, moving a pile of sand or raising a flag.	Examples of pulleys, levers, wheels, and inclined planes.	Were pupils able to demonstrate uses of simple machines? Were pupils able to choose appropriate machines for given tasks?	Technology Education – Machines.

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Unit 9: Forces – Types of forces and their effects.

Topic	Objectives			Content	Method/Strategies	Materials	Evaluation	Integration
	Knowledge	Skills	Attitude					
Getting the better of gravity	Explain how gravity affects objects. Demonstrate how the effects of gravity can be reduced.	Manipulate equipment in-vestigations Observa-tions	Display imagination, in-ventiveness.	Gravity is the force which attracts objects to the Earth. All objects that are in the air have a tendency of fall. Some objects fall more slowly than others, and some can defy gravity completely (that is, they can fly is determined by factors such as air resistance, shape, sizes and relative mass.	- Working in groups, pupils are given an object such as a lime, small doll or stone. - They investigate how they can slow down the rate with which the object falls, or get it to remain in the air. - They measure how long it takes to fall and try to improve the methods they used. - Under teacher guidance, each group measures how long it takes their item to fall from a fixed height. Prizes can be given to the winners.	Tape, paper, cardboard, small doll, egg, stone, string, scissors, paste, plastic bag, cloth.	Did the pupils try various methods to prevent the object falling? Did pupils try to improve their methods in light of observations made?	Technology Education – Flight.

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