UNIT: EARTH'S WEATHER (GRADE 2)

DURATION: 6 Lessons

OBJECTIVES

The students should be able to:

1. Draw a simple diagram to represent the water cycle.
2. Design and construct a simple rain gauge to measure rainfall.
3. Design and construct a simple anemometer to measure wind speed.
4. Take and compare measures of rainfall, temperature, wind direction and wind speed on different days.

PROCESS SKILLS

Observing
Classifying
Communicating
Inferring
Measuring
Manipulating
Designing
Experimenting
Recording
Problem solving

ATTITUDES

Concern for safety
Respect for evidence
Inventiveness
Commitment to accuracy
Critical reflection

MATERIALS

Rain gauge

Plastic cups

Bunsen burners/lighting fluid

Bits of various materials

Measuring cylinders/cups

CONTENT SUMMARY

- Water goes round and round in nature. When rain falls, the heat of the sun evaporates some of the Earth's water back into the air as water vapour. This vapour cools, condenses (forms clouds) and falls back to the Earth as rain. This process is known as the Water Cycle.
- Rainfall is measured by a rain gauge.
- An anemometer is used to measure wind speed.

SUGGESTED ACTIVITIES

- Review components of the weather and their effect on people; hold discussion, referring to students' experiences.
- Plan an investigation as to what happens to puddles and other bodies of water during the day. Encourage students to hypothesize.
- Let students experiment in small groups, e.g.

  Give each group two cups with identical amounts of water. Students measure and record the heights of water in each cup. They then expose the cups to the sun, one covered and the other uncovered. At intervals, students observe and measure the height of water remaining in each cup. Record results in a table or by drawing. Discuss findings with students.

- Demonstrate the process of condensation by using cups filled with warm water covered with plastic wrap. Allow students to observe and discuss appearance of plastic. Repeat process with ice cubes on plastic.
- Demonstrate the water cycle. Allow students to observe the stages: evaporation, condensation, rain droplets.
- Give students enough time to observe and discuss. (Be mindful of safety rules.)
- Associate process observed with the process occurring in nature.
- Construct a rain gauge; observe and record rainfall.

- Discuss wind and wind-speed by observing the movement of objects on playground, flags, etc.
- Construct anemometer, using bits of materials of various grades beginning from light to heavy.
- Let students use their rain gauge and anemometer to take measurements each day for a week. They record their results in an appropriate way. Encourage students to note any patterns.

ASSESSMENT

Let students:

Label an illustration of a water cycle or using scrap material, construct a chart showing the water cycle.

Define operationally: a) rain gauge b) anemometer

Identify illustrations: a) rain gauge b) anemometer

Design and make:

Students use materials to construct a) rain gauge b) anemometer. Skills and attitudes such as manipulating materials, measuring, cooperation, persistence, can be assessed.

As they use weather instruments the following can be assessed:

- Measure and record rainfall over a period of time.
- Use information to construct simple graphs.
- Interpret data on a given graph.

ASSESSMENT CHECKLIST

Scoring rubric 1 poor
2 fair
3 good
4 very good

NAME ……

CONCEPTS	
States the processes in the water cycle	
Labels an illustration of the water cycle	
Names and define each process in the water cycle a) evaporation	
b) condensation	
Names instruments	
Operationally defines instruments	
PROCESS SKILLS	
Ability to a) observe	
b) measure	
c) record	
d) design	
e) infer	
f) manipulate materials	
g) solve problems	
ATTITUDE/GROUP SKILLS	
a) Accepts responsibility	
d) Participates in discussions	
e) Takes initiative	
f) Co-operates in a group	

UNIT: SOLAR SYSTEM (GRADE 2)

DURATION: 3 Lessons

OBJECTIVES

Students should be able to:

1. Name the sun, the earth and the moon as parts of the solar system.
2. Infer the position of the sun at different times of the day.
3. Identify the phases of the moon.
4. Identify patterns in the occurrences of day and night.

MATERIALS

Paper, Pencils, Crayons

CONTENT SUMMARY

- The sun appears to be in a different position at various times of the day because the earth rotates.
- Changes to daylight and nighttime come at almost the same time every day.
- The sun, the moon and the planets are parts of the Solar System.
- The moon is visible during the night and sometimes during the day.
- The appearance of the moon seems to change in a regular way.
- The moon gets its light from the sun.
- The sun, the moon and the planets are parts of the Solar System.

ACTIVITIES

- Let students investigate shadows and infer what conditions are needed for shadows to form.
- Let students set up an upright ruler or other suitable object in an area open to the sun on a sunny day and investigate the position of shadows at various times during the day:

a) morning b) noon c) afternoon

- Allow students to draw object and shadows.
- Discuss the position of the shadow and infer the position of the sun at different times of the day. Demonstrate that if one student remains still (sun) and another student spins around on one spot (Earth), sometimes the "sun" is on the left, on the right, in front of and behind the "Earth."
- Observe the position of the sun early on mornings, at noon and at sunset. Integrate with Social Studies to identify cardinal points.
- Let students discuss how the sun affects the moon and the Earth (it gives light); how the moon affects the Earth. Let students say names of other planets they know. Discuss that these are all objects in space which form part of a group of objects named the Solar System.
- Encourage students to find simulations of the solar system using computers.
- Let students record the time of sunrise and sunset from the weather news for an extended period of time. Let students look for patterns. These times can be compared with times in other temperate countries. Let students listen to weather news to get times.

ASSESSMENT

Drawing

Objectives on which questions can be based:

- Given the illustration of an object and a time of day, and the position of the sun, students should be able to draw the shadow, which is most likely to appear.
- Students should be able to illustrate the appearance of the sky at sunrise and sunset.
- Students should be able to illustrate the appearances of the moon.

Questions

Write true or false for each of the following statements.

1. The Sun moves. _____
2. The Earth moves. _____
3. On mornings and evenings the shadows are long. _____
4. Shadows are longer at noon. _____.
5. The moon cannot be seen during the day. _____
6. A full moon looks like a complete circle. _____
7. We can only see part of the moon sometimes. _____
8. The moon has its own light. _____
9. The sun gives the moon light. _____
10. A shadow can be formed without light. _____

ASSESSMENT CHECKLIST

1 Not at all
2 Partially
3 Fair knowledge
4 Good knowledge

Name ----------

CONCEPT	
Knows about a) sunrise	
b) sunset	
c) length of shadows	
d) appearance of the moon	
PROCESS SKILLS	
Ability to: Communicate	
Infer	
Draw conclusions	
Observe	
ATTITUDE	
Curiosity	

UNIT: EARTH'S RESOURCES (GRADE 2)

DURATION: 8 Lessons

OBJECTIVES

Students should be able to:

- Explain the dangers of litter.
- Discuss how the problems of litter in schools could be avoided.
- Organize and participate in a clean-up project.
- Identify at least two air pollutants found in a particular area.
- Discuss how pollutants affect people's activities.
- Construct a trap for collecting dust from the air.
- Compare the amount of pollution found in different areas using the constructed air trap.
- Identify and compare devices developed to protect workers from air pollution.

PROCESS SKILLS

Observing
Classifying
Communicating
Inferring
Designing
Problem solving
Manipulating
Hypothesizing

ATTITUDES

Curiosity
Concern for safety
Stewardship of the environment
Inventiveness
Creativity

MATERIALS

Markers
Paper Bristol board
Bunsen burner
Discarded material from the environment
Beakers
Pyrex

CONTENT SUMMARY

- Litter is unhealthy. It is degrading to the environment.
- Litter can cause diseases, flooding, injury, an increase of pests (rats, flies, cockroaches, etc.).
- There are many ways by which we can solve the litter problem in our school.
- We can embark on:
  - clean-up projects
  - recycling projects
  - litter awareness campaigns, etc.

- Air will have pollutants according to the environment in any particular area.
  - Exhaust from vehicles will most likely pollute a busy city.
  - Smoke from burning land or smoke from making charcoal is most likely to pollute a rural area or a farming community.
  - Dust will pollute the air during construction, demolition, etc.
- Most pollutants can cause health problems, especially to babies, older people and those with breathing problems such as asthma.

  There are also some airborne diseases which can affect us. One of the most common is influenza.
- We can investigate the air around us by constructing devices for collecting dust particles in the air.
- Water is a liquid
- The state of water can change when exposed to heat or cold.

SUGGESTED ACTIVITIES

- Help students to observe and study the litter problem in the class or school as the need arises. Let them fill in recording sheets to assess the litter in the area chosen.

- Encourage and enable students to devise a plan for a clean-up project.

- Supervise and let students execute their plan.

- Encourage students to embark on an awareness campaign for school. Help pupils make signs, slogans, rhymes and jingles for a litter-free environment.

- Let groups of students devise ways they can recycle some discarded material.

- Allow students to investigate their community and report on litter collection, indiscriminate dumping of garbage, careless littering, etc.

- Encourage students to state ways by which they think that the problem can be alleviated.

- Invite resource personnel to speak to students about garbage handling and disposal.

- Discuss how the relevant authorities handle litter collection and disposal.

- Visit landfill area or other dumping sites. Observe and discuss methods used.

- Review how air can be unclean. List air pollutants.

- Allow students to brainstorm to state some of the jobs where workers may work in polluted air, e.g. construction sites, industrial sites, on farms where burning or chemical use takes place.

- Discuss ways people have developed to protect the worker from dust pollution in some work places. Examine a variety of masks and discuss how they work.

- Discuss the health problems, which are most likely to occur due to polluted air. (asthma, flu, etc.)

- Enable students to construct simple devices to trap particles in the air.

- Let students suggest how they could compare air pollution in different areas. Help them to set up their experiments. Observe, record and discuss findings.

- Investigate properties of water:

  Experiment with water, demonstrating freezing and evaporation.

ASSESSMENT

Service Learning

As students work on their clean-up campaign they can be asked to

- Design a poster to put up in your school or community to make people know that littering is unhealthy.
- Write a poem or rhyme of about 4 lines about littering.

They can be assessed on various skills and attitudes such as:
Ability to communicate ideas, Creativity, Persistence, Cooperation

Drawing

- Draw a picture, showing how people's activities can result in air pollution.
- Draw a picture of sanitary workers at work disposing garbage. Write sentences to explain your picture.

Written

- Write a paragraph giving three reasons why we must not litter.
- Write a paragraph telling ways by which you can help solve the litter problem in your neighbourhood.
- Name two illnesses which may be caused by polluted air.

Objective Type Questions can be based on the following:

- Name the relevant authorities for garbage disposal on their island.
- Given a list of activities, students should be able to identify the activities which will result in pollution.
- Given a list of pollutants, students should be able to identify those which can affect the air.
- Students should be able to complete flow charts showing the changes in the states of water.

ASSESSMENT CHECKLIST

Checklist 1 poor
d) fair
e) good
f) very good

Name ----------

CONCEPT	
Understands that humans' activities can pollute the environment	
State how pollution can affect our health	
State how some machinery and manufacturing can pollute the environment	
State properties of water	
Understand that heat or cold can change the states of water	
PROCESS SKILLS	
Ability to:	
Communicate	
Infer	
Solve problems	
Design effectively	
Manipulate materials effectively	
Observe	
ATTITUDES	
Co-operates with others	
Accepts responsibility	
Follows procedures safely	
Shows concern for the environment	
Presents work neatly	
Shows creativity	
Shows initiative	

UNIT: DIVERSITY AND CLASSIFICATION (GRADE 2)

Topic: Human Variation

Duration: 2 Lessons

Specific Objectives

Students should be able to:

1. State ways in which people are alike and are different.
2. Group themselves according to similarities.

Process Skills

Observation, Classification, Inference.

Materials

Use students themselves for this activity.

Content Summary

Animals have similarities which are used to classify them into certain groups.

Students should recognize the similarities of animals as they organize their specific groups.

People are similar and are different in many ways: colour of skin, colour of eyes, height, weight, colour of hair and gender.

Suggested Activities

Students make groups of themselves, with similar weight.
Students group themselves according height.
Student design and make a poster of their names listing their height and weight.

Topic: Living and Non-living Things

Duration: 2 Lessons

Specific Objectives

Students should be able to:

- Make a presentation displaying living and non-living things.

Process Skills

Observation, Classification, Communication

Materials

Charts of living and non-living things

Samples of non-living things

Samples of living things

Concept maps

Posters of favourite animals

Posters of endangered animals

Portfolios/ scrap books

Content Summary

Students can communicate to others their methods of classifying living and non-living things. The opportunity must be provided for students to display their work and make presentations on their findings. They should be encouraged to accept responsibility. Accepting responsibility can heighten their interest in science.

Students can make groups of living and non-living things. Then further sub-divide living things according to size, body covering and food eaten.

Suggested Activities

Students plan an exhibition and display their posters, models, portfolios, scrapbooks, samples, etc, 'in the multipurpose classroom'.

Students explain their exhibits to students from other classes and parents who are invited to view the exhibition.

Make posters of endangered animals.

Make concept maps and concept webs.

Assessment

Teachers should provide a checklist for assessment of students' work.

Invite students and parents to view the students' exhibition.

Topic: Characteristics of Living Things

Duration: 2 Lessons

Specific Objectives

Students should be able to:

- Name some characteristics of living things such as **reproduction, feeding, moving and growing.**

Process Skills

Observation, Inference, Classification, Communication

Materials

Charts of animals and their young animals feeding

Videos of animals in their habitat

Seeds, soil, jars

Content Summary

Living things, both plants and animals, carry out a series of similar activities. They reproduce, feed, grow, breathe, and respond to stimuli.

Some animals reproduce by laying eggs. In others the young develop inside the females' bodies.

Some plants reproduce by producing seeds. Plants also reproduce by cutting, and suckers. Plants make their own food using sunlight, water and air. Animals depend on plants (directly or indirectly) for food.

Both plants and animals increase their size and weight – this is growth (they get bigger).

Animals move from place to place (walk, swim, fly) – in search of food, shelter, protection (man – pleasure) Plants have very little movement except growth.

Suggested Activities

Activity 1
Students observe animals in their environment (where possible) and/or videos. Use their observations to stimulate class discussion on some characteristics – reproduction, feeding, movement and growth.

Activity 2
Students make charts and/or scrapbooks -
Parents and their young (reproduction).

Activity 3
Students make charts and/or scrapbooks -
Animals eating (feeding).

Activity 4
Students make charts and/or scrapbooks -
Using pictures of animals and movement (movement).

Activity 5
Students make charts and/or scrapbooks -
Display different sizes of an animal. (growth).

Students carry out germination experiment by planting seeds in jars and observing them grow. This activity could be used to establish two characteristics of living things (i) reproduction and (ii) growth.

Assessment

Students make charts, scrapbooks and portfolios and posters:

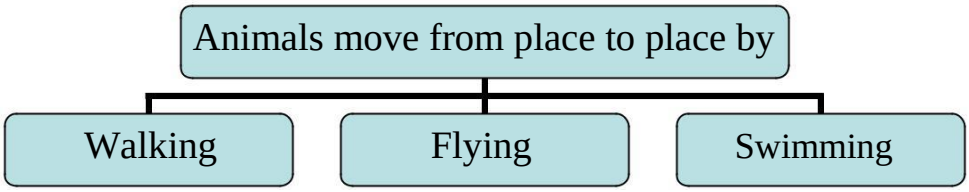
- plants showing different sizes to illustrate plants growth and reproduction.

Students design and make posters illustrating different methods of movement by animals.

- Animals, which fly (animals can be similar and/or different).
- Animals which swim .
- Animals which creep/crawl.
- Animals which can move swiftly etc.

N.B. Students could be organized to complete projects, portfolios, scrapbooks, etc.

Students can make simple concept maps to show the characteristics of movement. (**N.B.** this can be done for any of the characteristics).



Students make posters of animals: those that feed on plants, those that feed on animals etc.

Students make posters of animals, which care for their young.

Topic: How do Plants Differ?

Duration: 3 Lessons

Specific Objectives

Students should be able to:

1. Define: (i) plant (i) Tree (iii) Shrub (iv) Vine (v) Herb
2. Identify different kinds of plants.
3. Name two types of leaves that are found in plants.
4. List different uses of leaves in everyday life.

Process Skills

Observing, Classifying, Recording, Manipulating, Designing

Content Summary

There are diverse plants existing on earth today**. Plants** vary in size and appearance and may be grouped into different categories such as **trees**, **shrubs**, **vines** and **herbs**.

A **tree** is a perennial plant that has a single self-supporting stem or trunk, which is un-branched for some distance above the ground.

A **Shrub** is a woody plant that is smaller than a tree, and is usually divided into separate stems from near the ground.

A **Vine** (also called a runner) is a plant with slender stems that trail or climb.

A **Herb** is a plant that has a stem that is not woody; it dies after flowering.

The type of leaves that plants have also varies. Leaves may be **simple** or **compound**, have a small or a large **size** and may be of a variety of **shapes** and **colours**. Some leaves have **netted veins** and others have **parallel or straight veins**.

Plant Type	Examples
Trees	mango, avocado, coconut, orange
Shrubs	hibiscus, oleander, tangerine, sage
Vines	potato, yam, pumpkin, melon
Herbs	chives, thyme, carrot, mint

Leaf Samples

Suggested Activities

1. Students tour their school yard/community in groups to observe plants in general. List names of common plants that are examined. Collect samples of leaves from or photograph each plant that is considered. Use the definition for each type of plant to group the list into trees, shrubs, vines and herbs. Present the result in a table.

   Students either collect their own leaf samples or are given samples by their teacher. They sort them into groups using different properties (colour, size, pattern of leaf veins, etc). Present an oral report.

2. Create a collage using a variety of leaves.

   Use leaves to do block painting/stamping as an integrated Art and Craft lesson. Examine the pattern of veins in each stamp.

3. Discuss the use of leaves in everyday life. Plan and implement a 'show and tell' in which students present leaves used in different ways.

Suggested Assessment

1. Grade result of each activity above.

UNIT: ECOSYSTEMS (GRADE 2)

Topic: Adaptation of Organisms to their Environments

Duration: 2 Lessons

Specific Objectives

Students should be able to:

- Investigate how organisms adapt to their habitats.
- Identify some features of organisms that are designed to enable their survival in their habitats.
- Appreciate that organisms are adapted to survive in their natural environments/ecosystems.

Process Skills

Observing, Investigating, Constructing

Materials

Video (*documentary on adaptation*)

Content summary

Adaptation is a **characteristic** that improves an organism's ability to **survive** and reproduce in a particular habitat. For example: fishes are streamlined so that they can glide through water; they also have **fins** so they can swim. Mangroves have **prop roots** to support them from shifting/falling over in the soft soil.

Suggested Activities

Examine plant and animal specimens to see what features they possess and associate the features with the organisms' habitats.

Describe the features of different animals and plants that make it possible for them to live in their particular habitats.

Match the movement of animals with the type of appendages they possess (e.g. legs for walking, wings for flying, etc.).

Assessment

1. Give oral report on adaptation of a familiar organism.

2. Write a story about how a specified plant/animal is able to survive in its environment.

3. Match the type of motion animals have with named features.

Topic: Feeding Relationships and Defence (in animals)

Duration: 2 Lessons

Specific Objectives

Students should be able to:

1. Identify feeding relationships among organisms (*use terms: herbivores, etc.).*

2. Investigate predator-prey relationships.

3. Construct simple food chains to represent the feeding relationships among plants and animals.

4. Identify natural defences that animals use to help them survive (spines, camouflage, etc.).

Process skills

Observing, Investigating, Constructing

Materials

Worksheets (*animals to type of defence*)

Content summary

Some animals feed only on plants; these are called **herbivores**. Some animals feed only on the flesh of other animals; these are called **carnivores**. Animals that feed on both plants and animals are known as **omnivores**.

Green plants make their own food using energy from the sun; they are called **producers**. Animals do not make their own food; they are called **consumers**. Consumers are **primary**, **secondary** or **tertiary**.

An animal that is eaten by another animal is called a **prey**, while the animal that does the eating is called the **predator**. Different animals have special mechanisms that they employ for their own protection. Examples of **defence** mechanisms are **venoms**, **stings**, **camouflage** and **spines**. The feeding relationships among organisms in an environment may be represented by simple **food chains**.

Suggested Activities

1. Carry out 'Animal Interviews' in which students pretend to be different familiar animals. Ask the 'pretend animals' to say what they eat, and where the eaten (plant/animal) got its food. Record the information representing the food chain on the chalkboard.

2. Arrange the flash cards to represent food chains showing the pretend animals' feeding relationships.

3. View a relevant episode of (Wild Safari/Animal Stories/Umba Macomba/Animal Planet) on television.

Assessment

1. Grade flash card activity.

2. Construct food chains from given list of organisms.

3. Match animals to their respective defence mechanism (bees, frogs, cats, lizards, etc).

Topic: Effects of Environmental Destruction

Duration: 2 Lessons

Specific Objectives

Students should be able to:

1. Define the term, environmental destruction.

2. Investigate the factors that result in environmental destruction.

3. Identify some ways in which environmental destruction may be prevented.

Process Skills

Observing, Communicating, Predicting, Classifying

Materials

Red and green labels
Pictures
Slogans
Newspaper clippings
Garbage bins
Waste paper baskets

Content summary

When the environment is **destroyed**, the people, animals and plants in it are affected negatively. The negative effects may be **lack of food and shelter**. Organisms become **endangered**, and there may be the threat of death or even **extinction** of some species.

Suggested Activities

1. Discuss some of the ways in which the environment may be destroyed whether by human or by nature itself.

2. Visit an area in the community or the island that exemplifies environmental destruction.

3. Observe, predict and/or discuss effects of environmental destruction using pictures.

4. Place a red (for unhealthy environs) or green (for healthy environs) label on the relevant parts of their school/class/community compound and then develop strategies to convert red label areas into green label areas.

5. Read prepared literature relevant to topic.

Assessment

1. Explain orally the term 'environmental destruction' and give examples.

2. Group work: let students prepare posters depicting an example of environmental destruction, its causes, effects and a solution (if possible).

3. Simple test in which students list ways in which the destruction of the environment negatively affects life.

Topic: Solid Waste Management

(*Integration of Life Science: Ecosystems, and Earth and Space Science: Earth's Resources*)

Duration: 2 Lessons

Specific Objectives

Students should be able to:

1. State the meaning of solid waste.

2. Identify methods of managing solid wastes in the home/school/community (recycling, etc.).

3. Discuss how the problem of litter in schools could be avoided.

4. Organize and participate in clean-up projects.

5. Construct a toy using discarded materials/items.

Process Skills

Constructing, Communicating

Materials

Discarded items (*for making toys*)
Video (*solid waste management documentary*)
Resource person (*solid waste management department*)

Content summary

Articles that are **discarded** and any solid **waste materials** or garbage need to be properly handled if the environment is to remain **clean** and **healthy**. This is known as solid waste management. In most communities there is a **solid waste management** department that runs a solid waste management programme. Individuals must play their part to ensure that such efforts are effective. Controlling littering is one of the ways in which we can contribute to the proper management of solid waste in our homes, schools and communities.

Suggested Activities

1. View documentary about solid waste management.

2. Interact with resource person who makes a presentation on solid waste management.

3. Discuss how the problem of litter in the school could be avoided.

4. Organize and implement school/community clean-up projects.

5. Construct a toy using discarded materials/items.

6. Hold mini-exhibition of toys that were constructed (*class or school level*).

Assessment

1. Teacher-made test.

2. Write poem/song about solid waste management.

3. Create posters depicting Do's and Don'ts for a litter-free environment.

4. Grade plan and implementation of group clean-up efforts.

5. Grade toys that were constructed from 'throw-away' items.

Topic: Making Different Sounds/Musical Instruments

Duration: 2 Lessons

Specific objectives

Students should be able to:

1. Name the human organ that is stimulated by sounds.
2. Classify sounds by pitch and loudness.
3. Construct and use simple musical instruments.

Process Skills

Observing, Classifying, Communicating, Manipulating

Materials

Cans
Bottles
Seeds
Bottle caps
Wire
Pliers

Content summary

The ear is the organ that detects **sound**. A sound may be soft or loud, or its pitch can be high or low. Different **musical instruments** make different sounds. The **quality** of a sound is what distinguishes it from all other sounds.

Suggested Activities

1. Students make simple musical instruments and experiment with them to make different sounds.

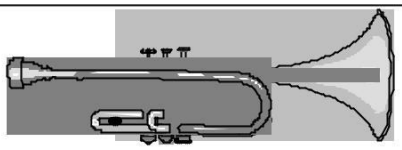
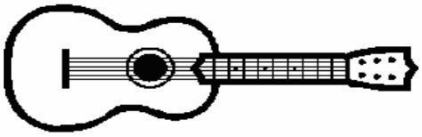
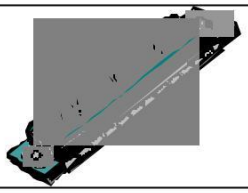
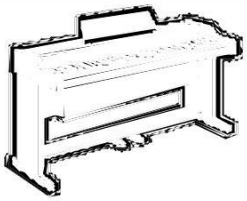
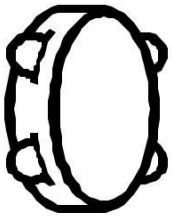
2. Students predict the pitch of the sound that dropped objects would make, and then test to see if they were right.

3. Play guessing game in which blindfolded students guess what is being tapped based on the sound produced.

Assessment

1. Grade the students' musical instruments from activity.
2. Play the sounds from different musical instruments and ask students to identify what makes the sound in each case.

3. Match each instrument to its name. Connect each pair with a line.

Guitar	
Piano	
Tambourine	
Trumpet	
Maracas	
Drum	
Harmonica	

UNIT: STRUCTURE AND FUNCTION (GRADE 2)

Topic: Plants and Animals Develop in Different Ways

Duration: 6 Lessons (30 minutes each)

Objectives

Students should be able to:

1. Identify and name the different stages in the development of animals in their environment.
2. Identify and name the different stages in the development of plants in their environment

Process Skills

Observation
Communication
Classifying

Materials

Live specimens of animals at different stages of growth and development Charts with pictures/diagrams depicting different stages of development in selected animals
Pictures of animals and their young
Plasticine/Play dough
Storybooks with stories of animals and their young

Content

Many plants begin their life as a seed. The seed develops and grows into a seedling. The seedling grows and develops into a mature plant bearing flowers.

Animals undergo changes as they grow and mature into adults.
Stages in development of:

Human	Baby	Infant	Child	Adolescent	Adult
Birds	Eggs	Chicken	Adult bird		
Fish	Egg	Fry	Adult		
Amphibians (Frogs)	Egg	Tadpole	Adult		

Insects (Butterfly)	Egg	Larva	Pupa	Adult
(Cockroach)	Egg	Young Adult (Nymph)	Adult	
Spiders	Egg	Young adult	Adult	

Activities

Activity 1

- Field trip to a farm/agricultural station/zoo to observe plants and animals at different stages of development.
- Collection of pictures depicting different stages of development of animals and plants at different stages of development.

Activity 2

- Let students collect plants at different stages of development.
- Allow students to arrange pictures from the seed stage to the mature plant.

Activity 3

5. Let students collect animals at different stages of development e.g. leaves with insect eggs; caterpillars, cocoons, adult butterflies and moths; frog's eggs and tadpoles; Jack Spaniard nests: mosquito larvae, etc.

Activity 4

¬ Allow students to arrange pictures of animals from the youngest to the mature stage. Let them talk about the animals and let them name the different stages of development.

Activity 5

¬ Provide students with play dough and have them make models of different animals at different stages of development e.g. eggs, tadpoles, insects.

Activity 6

¬ Read stories/poems to students. Stories could involve animals and their young; a young animal growing up. N.B. *Stories must relate to the objectives.*

Assessment

- Let students match pictures of animals and their young.
- Let students look at pictures of animals and their young and identify which animals have young ones that look like their parents and which ones do not.

UNIT: ENERGY (GRADE 2)

TOPIC: MAKING USE OF TECHNOLOGY

DURATION: 2 Lessons

OBJECTIVES:

Students should be able to:

- List devices in the home and community that use electricity or other forms of energy.
- State ways in which energy-using equipment has improved the quality of our lives.
- Suggest difficulties we may encounter without the use of such equipment.
- Appreciate that people use energy to solve some of their problems.
- Compare old and new technological devices.
- Infer that people keep inventing new things to make them better.

PROCESS SKILLS

Observing, Communicating, Inferring, Classifying.

MATERIALS

Pictures of home and community settings showing various items of equipment and appliances: refrigerators, stoves, cookers, toasters, vehicles, etc.

Small home appliances – toasters, blenders, electrical irons.

Pictures depicting older forms of technology – wood fires, donkey-carts.

CONTENT SUMMARY

Electricity is a form of energy.

Many devices in our homes and community need electricity to work.

Some equipment in the home and community use other forms of energy (kerosene stoves, gas cookers, vehicles use gasolene and diesel).

Energy-using equipment in the home and community has helped to improve the quality of our lives.

Refrigerators preserve our food so we can buy in bulk.

Gas, electrical and kerosene stoves are more convenient to use than wood fires.

Vehicles take us to our destinations faster than if we had to walk or use donkey carts.

SUGGESTED ACTIVITIES

Use picture display to stimulate class discussion on equipment in the home and community that use electricity. First, let students identify the devices, then have them suggest ways in which they are useful.

Use picture display to stimulate a similar discussion on equipment that use other forms of energy.

Demonstrate the use of similar small appliances: blender to grate coconut, toasting bread in a toaster.

Use pictures of older technology to stimulate discussion on the difficulties we may encounter without the use of modern technologies.

Allow children to compare old and new technologies (e.g. rotary and touch phones; digital and analogue clocks; sail and motor boats). Let students record their findings in a Table.

Let students discuss with their grandparents how they did certain tasks when they were yo ung and write a short paragraph about their findings and collect pictures if possible.

ASSESSMENT

Game of musical chairs in which the players wear picture labels depicting different equipment. As players get out let group list the problems they would face without that player/equipment.

Assess students' ability to observe, infer and communicate in Activity 5.

TOPIC: WINDMILLS AND WATERWHEELS

DURATION : 1 Lesson

OBJECTIVES

Students should be able to:

- Observe and identify devices that use moving air and moving water as energy sources (e.g. windmills, water wheels).
- Infer that wind and water are sources of energy.

PROCESS SKILLS

Observe the movement of water wheels and windmills.
Communicate what causes the movement.

MATERIALS

Pictures of windmills, water wheels, video tape of windmills, water wheels, pieces of cardboard, open umbrella devices.

CONTENT SUMMARY

Devices such as windmills and water wheels need moving air/water to make them move.

The wind provides the energy to move the windmills and the moving water provides the energy to move the water wheels. Water wheels and windmills are used to turn machines in factories and generate electricity.

SUGGESTED ACTIVITIES

Let students try to run with an umbrella, first opened and then closed. Discuss observations and establish that air/the wind can produce a force and that this force can be used to make things move.

Display pictures of windmills and waterwheels in use. Show videotape if available. Use these to stimulate discussion on the devices

Identify what they are
Establish how they work

Establish what they are used for (turning machine in a factory, generating electricity, etc)

Let students find out where there are windmills and water in use in their community or country.

ASSESSMENT

Checklist- Did students identify correctly/communicate clearly?

UNIT: FORCES, MOTION AND STRUCTURES (GRADE 2)

TOPIC: EFFECTS OF FORCES

DURATION: 2 Lessons

OBJECTIVES

Students should be able to:

Ø Identify forces used to create movement or change in given situations.
Ø Demonstrate ways in which motion can be changed (start movement, increase speed, reduce speed, change direction).

PROCESS SKILLS

Observing, Manipulating.

MATERIALS

Play dough, balls, toy car/truck, piece of string

CONTENT SUMMARY

➢ Push and pull forces can be used to cause objects/things to move, stop moving, slow down, increase speed, change direction, change shape.

SUGGESTED ACTIVITIES

· The closing and opening of a door can be used to reintroduce the concept of push and pull.

· Use ball (soccer ball would be ideal) to demonstrate the following: use of force to start motion; use of force to change direction; use of force to increase speed; use of force to stop the ball. In each case create the situation and either ask students for directions as you demonstrate the action or ask students to perform the action. Engage students in in-depth discussion to enable them to identify the force used in the particular situation. Let them give examples of other similar situations.

Present students with pieces of play dough and let them turn dough into various shapes: flat, long, round, etc. Let students explain what had to be done to acquire the various shapes. Establish that push and pull forces can be used to change the shape of objects. Let them give examples of other situations in which force brings about change of shape.

Toy cars/trucks may be used to have students demonstrate the use of force to bring about the various changes.

ASSESSMENT

Display a cricket bat and a ball and let students explain and demonstrate situations in the game of cricket when a force is used to increase the speed of the ball; to stop the ball; to change direction of the ball, etc.

TOPIC: SIMPLE MECHANICAL DEVICES

DURATION: 2 Lessons

OBJECTIVES

Students should be able to:

Identify simple mechanical devices.

State the functions of these devices.

PROCESS SKILLS

Observing, Manipulating

MATERIALS

A mounted door (door to the classroom, cupboard door), hinges, locks, door bolts, bolts and nuts screws, screw drivers, hammer, nails, brackets, braces.

CONTENT SUMMARY

- In order to put a structure together several different parts are needed. These parts have different functions.
- Hinges are used to support doors and enable them to swing to close and open.
- Some bolts are used to secure doors and windows.
- Locks are used to secure doors and prevent them from being opened easily. Screws and nails are used to hold parts together.
- Braces are used along with screws to hold parts of a structure together (an example is where they are used to fasten the sides of a bed to the legs). Brackets are used to support shelves.
- Bolt and nuts are used to hold parts of a structure together (an example is the wheels on a vehicle or a bicycle).

SUGGESTED ACTIVITIES

1. Examine the door to the classroom and have students identify all the things that were used to put the door together. Make a list of these things. This activity can be repeated looking at another type of door such as one to a cupboard. Engage students in a discussion in order to

establish the use of the various devices (nails, screws, hinges, locks, bolts).

2. Group students and distribute devices such as locks and keys, bolts, hinges, bolt and nuts, brackets, braces, etc. to each group and let students manipulate them in order to gain a better understanding as to how they work. Let students explain the uses of such devices, and demonstrate where possible.

3. Let students identify and list such devices in use at home. Let students share and discuss their findings.

ASSESSMENT

- Do a what-if quiz. (What if our door had no hinges? What if our door had no lock? What if our door could not lock?)
- Let students match appropriate device to pictures of different places of use.

Picture of Object/structure	Device
Door	
Shelf	
Vehicle wheel	
Window, etc.	