

# SCIENCE AND TECHNOLOGY

## CURRICULUM GUIDE

### KEY STAGE 2

## GRADE 6

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## CONTENT PAGE

CONTENT	PAGE
INTRODUCTION	3
SUBJECT SUMMARY TERM I	7
UNIT 1- LIVING THINGS IN THE ENVIRONMENT	8
UNIT 2- WEATHER AND CLIMATE	12
UNIT 3- ENERGY	14
UNIT 4- AGRICULTURAL PRACTICES	17
SUBJECT SUMMARY TERM 2	21
UNIT 5- PLANTS AND ANIMALS	23
UNIT 6- RESOURCES	24
UNIT 7- FORCES	28
UNIT 8- CROPS	31
SUBJECT SUMMARY TERM 3	35
UNIT 9- ADAPTATION OF ORGANISMS	36
UNIT 10- SOLAR SYSTEM	38
UNIT 11- MATTER	40
UNIT 12- ANIMALS	43
SAMPLE UNIT PLAN	45
SAMPLE LESSON PLAN	46

## INTRODUCTION

We may express with very little opposition that science is the study of nature, which includes the biological and physical world. It is also accepted, that Technology on the other hand is a method of problem solving. This requires all the necessary resources and skills to be used to gather objective evidence. Then, design and develop gadgets geared towards making life easier and more pleasant for human kind.

The present science and technology curriculum for ks1 and 2 is designed to developed skills and habits of mind which are not only directed towards investigating and arriving at plausible conclusion but also finding answers to the problems that affect our daily life. Thus, science education will develop personal strengths which can be directed in a properly conceptualized and implemented science programme. These strengths include the ability to read, understand and write complete mathematical operations, to develop good communication, interpersonal and intra-personal skills, problem solving skills and critical attitude to work.

The Curriculum guide has proposed a number of science activities geared towards helping all pupils develop their personal strengths. The science and technology activities are also expressed in such a way that they should meet pupils' social and psychological needs of recognition, affection, security, belongingness and so on. Pupils will be able to demonstrate an awareness of social realities and natural phenomena, and their natural curiosity should be tapped and made the prime motivating device in inspiring them to learn about science and technology.

Through the science and technology programme, pupils will enjoy science as a fun activity which includes artistic experiences, creating projects, carrying out investigations that they planned, taking part in science games and contests (Science Fairs), recognizing that recreational activities and sports, example basketball have science information for students. Pupils involve in science activities will also recognize science as a means of advising them, on how to live healthy and safety life styles.

The agriculture strand included in the science and technology programme at every key stage of primary education is an indication that the ministry sees such important industry as being very critical in our food security policy. So in order to make sure that our pupils are given the opportunity to apply science and technological knowledge and skills, to identify and solve practical problems related to the sustainable use of agricultural resources, to facilitate production, distribution and marketing in order to meet the needs of society, is worthy that it be included in the science curriculum and not as a separate subject.

The Curriculum guide is organizes in such a way that it can be easily followed by teachers, pupils and parents. In the past it was felt that a process approach was the way forward to an authentic science curriculum guide. However, we at the curriculum unit have noticed that the teachers find it easier teaching from a content based model. The

teachers must realise that science needs a lot of preparation if pupils are to gain and learn the maximum from their efforts. No longer should we concentrate our efforts on the above average pupils.

The differentiation of the curriculum in order to address the learning needs of all pupils should be our foremost goal if we are to comply with the ministry's vision of quality education for all. Very importantly, our pupils are not at the same level. This will have serious implication for the exposure of the curriculum to all pupils. Differentiation is one of the approaches that we can use to help all pupils to learn at their own pace and level. Some of the activities are less difficult than others, as a result, we should allow the more academically advanced pupils the opportunity to do these activities and give the easier activities to the slower or weaker pupils, so that they can develop a sense of achievement.

The science and technology curriculum was not designed for a text book but rather for the scientific advancement of all pupils. While we all agree that not all students will develop the necessary skills to be doctors and engineers, however, all our pupils must be given that choice rather than we making that choice for them. All our pupils can be equipped with the minimum science skills which can permit them to take part in a day to day conversation on the various natural phenomena and the way such phenomena impact our environment.

Thus, the programme is organized into four broad strands to include; Life Science, Earth and Space Science, Physical Science, and Agricultural science. It is expected that these strands together with the teachers' intervention and guidance will equip students with the necessary knowledge and skills required for the successful completion of the learning programme. The learning outcomes and success criteria should be seen as a step forward towards a pupil's centred learning programme.

We are calling on our hard working teachers to become facilitators in the management of the curriculum instead of being the distributors of knowledge. Pupils or pupils can play a part in contributing meaningfully to their own learning. When this is done, science becomes exciting, fun, interesting and enjoyable. We need to stimulate our pupils' interests by giving them the opportunity to express themselves with little or no interruption, is the way to go. Here we also have a role, only this time, we are clearing the misconceptions which will rise time and time again.

Science and technology are also linked to all the various subjects within the broader curriculum. Here we may mention that the scientific process is the preferred approach to investigating problems within the other subjects. The tools, devices and other gadgets necessary to deliver the other subjects are made possible through the timely inventions of technology. Science could not be completed without the added contribution of the social sciences, Health and family life education but more so for the direct impact of Mathematics and Language art on the scientific development of the pupils, the former for its measurement and calculation skills and the latter for its broad communication skills which are impacted on all pupils.

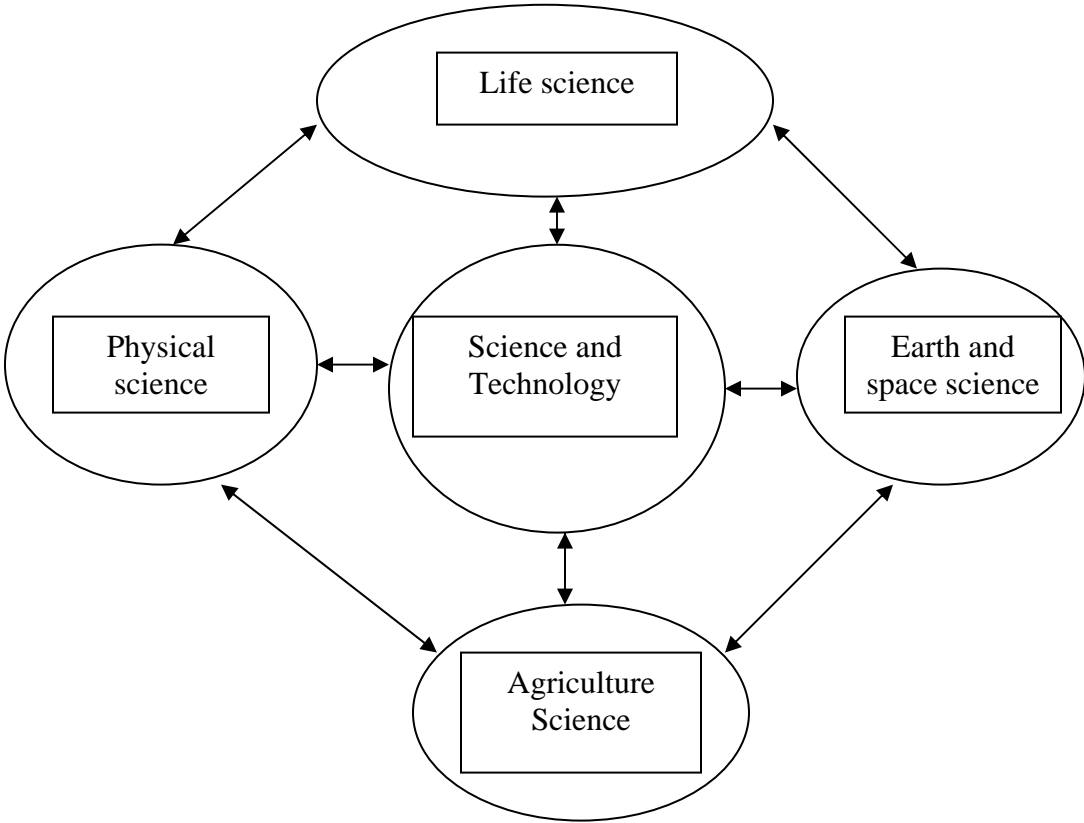
The term summary is broken in its various units, and is placed at the beginning of each term's activities. The term consists of four (4) units and each unit consist of the unit title, the learning outcome and the success criteria. A number of Success criteria have been designed to help students achieve the Learning outcomes and likewise a number of activities have been designed to facilitate the fulfilment of the success criteria. Teachers are kindly asked to carefully evaluate these activities and to feel free to develop their own activities to facilitate their students' specific learning needs. Make use of the various learning opportunities that the internet affords us, so that our pupils can be exposed to a wide range of learning opportunities so that their experiences won't be limited.

It is not an easy task to teach science to pupil of grade K, however we can guide them through, questions and answers, matching answers and colouring objects. Help them to observe using their senses and to describe what they discover. As they develop help them to be excited about the world around them so that they can begin asking questions and give responses. Remember that their interest in the subject at an early age will help them develop a love for it later.

In ending, always seek the most recent information to help your pupils develop scientifically. Scientific information is not absolute and may change as we advance because of the advent of new technologies and better approaches. Our environment is a big and well equipped natural laboratory and you are called upon to make use of this God give nature teaching tool.

FRANK J NEWTON  
E. O- SCIENCE

**LINKAGE OF SCIENCE AND TECHNOLOGY TO THE PROGRAMME STRANDS**



**TERM 1**  
**SUBJECT SUMMARY**  
**GRADE 6**

**KEY STAGE 2:** **SESSIONS**

**UNIT 1** **LIVING THINGS IN THE ENVIRONMENT** **6 – 8**

**AT 1:** **LO 1**

**SUCCESS CRITERIA: (1 – 3)**

**UNIT 2** **WEATHER AND CLIMATE** **4 – 6**

**AT 2:** **LO 2**

**SUCCESS CRITERIA: (1 – 2)**

**UNIT 3** **ENERGY** **6 – 8**

**AT 3:** **LO 1**

**SUCCESS CRITERIA: (1 – 3)**

**UNIT 4:** **AGRICULTURAL PRACTICES** **8 – 10**

**AT 4:** **LO 1**

**SUCCESS CRITERIA: (1 – 4)**



## **GRADE 6**

### **TERM 1**

#### **UNIT 1:**

#### **LIVING IN THE ENVIRONMENT**

#### **ATTAINMENT TARGET I:**

#### **LIFE SCIENCE**

#### **SESSIONS:**

(6 – 8)

#### **LEARNING OUTCOME:**

Research the changes in an ecosystem that can affect life.

#### **SUCCESS CRITERIA 1:**

**Identify and discuss some ways in which an ecosystem can change.**

#### **ACTIVITY:**

Take pupils on a field trip to observe the effect of deforestation on the ecosystem in their local community and present their findings to the class. Let them report on the organisms that are most likely affected by this change.

Prepare a written project to show effects of deforestation and or the effects of industrialization or use of land for residential purposes on plants and animal life. Also show the effect of these on rivers and river life.

Let pupils debate the topic “cutting or clearing our primary forest does or does not affect our wild life or ecotourism potential.” Or have a panel discussion. Teacher as moderator.

Take the pupils on a field trip to observe the effects of soil erosion on the local ecosystem. Let them write a report and present it to the class.

Use the activity on page 104 in Bright Ideas to prepare a lesson for the class let them name plants and animals in the local environment which are of importance to them and their community. They can simply

make a presentation to the class on the benefits that can be obtained from the rain forest.

**SUCCESS CRITERIA 2:**

**Explain the effect of changes in the environment.**

**ACTIVITY:**

Let pupils study the photos on page 107 of Bright Ideas, book 6. Let them explain how the effects of flooding and deforestation in the two bottom photos affect human, plant and animal life

Let pupils carry out a research on the various legislations or laws that protect our forests, national parks and wildlife and make a presentation to the class.

Invite a resource person from the forestry and wildlife department of the Ministry of Agriculture, lands and the environment to talk to the pupils. Let pupils write a report on the technicians' contribution (mark them for accuracy and content)

Let pupils carryout an investigation/study on how plants affect animals' survival. See workbook 5, pages 25 – 27, chapter 3, Let's Learn Science; activity 3.1. Also see Bright Ideas book 6 pg 107 "consequences of forest loss".

Let pupils find out if the plant roots and the steepness of slope affect soil erosion, Science. See bottom left picture in Bright Ideas page 103, book 6

**SUCCESS CRITERIA 3:**

**Produce a report that will illustrate different effects of changes in the environment.**

**ACTIVITY:**

Let pupils use the internet or the encyclopaedia as a resource to research the greenhouse effect. Let them write a report and present it to the class.

Let pupils use the internet, the encyclopaedia, the discovery channel or the national geographic to research the effect of melting of the ice-cap on low lying countries. Let them write a report and present it to the class.

Let pupils develop an activity to raise their awareness of the need for environmental conservation. See activity on page 110 Bright Ideas, book 6, entitled: Looking at threats to the environment

Imagine that you are members of a voluntary environmental group. Propose to your environment conservation council some ways to get your community involved in the conservation of the environment. Your proposal should include measures to control deforestation.

Take pupils on a field trip to the department of Forestry and let them learn the different types of trees that are selected for reforestation. Let them participate in a tree planting activity on their school surrounding together with the forestry department Youth Corps or with the local village council. Let them write a report on the activity that they carried out and present it to the class, either in groups or individually.

Let pupils carry out activity 3.4 on page 34 of Let's Learn Science 5(workbook): Research the type of trees that are used for reforestation. Find out why they are chosen over other types of trees. Write your findings in your note books.

**UNIT 2:**

**WEATHER AND CLIMATE**

**ATTAINMENT TARGET:**

**EARTH AND SPACE**

**SESSIONS:**

**(4 – 6)**

**LEARNING OUTCOME:**

Investigate different ways in which climate affects plants and animal life.

**SUCCESS CRITERIA 1:**

**Research the characteristics of plants and animals in different climatic zones.**

**ACTIVITIES:**

Let pupils use the internet or encyclopaedia to carry out a research on various plants and animals in different climatic zones. Let them make a presentation to the class, in small groups.

Place pupils in small groups of 4 – 5. Let the groups prepare a collage of either plants or animals that live in the tropics, desert or (tundra zone) or artic/Antarctic zone. Let them make a presentation to the class. They may choose to hold a class exhibition.

Try growing apples, pear or peach seeds: or any plant that grows in temperate zone; make observations: report to class: - This may include flowers and can also be done as a class project.

**SUCCESS CRITERIA 2:**

**Carry out an investigation on the effects of temperature on the growth of plants.**

**ACTIVITIES:**

Place pupils in groups of 4 – 5. Let them carryout an experiment on the effect of temperature on the growth of plants. Let them place two potted (same type) seedlings of the same age and size in a room with air condition, the other in another room with no

air condition. Let them water the plants daily and record the height of the plant every week for six (6) weeks. Also, let them record the number of leaves at the end of each week or at a chosen day of the week. Let them present their data in table and graph form at the end of the experiment.

Let pupils place two plants in different conditions of temperature. Let them place one plant in a very hot place and the other at room temperature or in the school garden. Let them record their observation every week for six (6) weeks. Let them present their data in table and graph form. Let them interpret the data so as to arrive at a conclusion.

Place students in groups of 4 – 5. Let them use the internet or encyclopaedia to research the effects of temperature on plant growth. Let them write a report and make a class presentation.

**UNIT 3:**

**ENERGY**

**ATTAINMENT TARGET 3:**

**PHYSICAL SCIENCE**

**SESSIONS:**

(6 – 8)

**LEARNING OUTCOME 1:**

Demonstrate that Energy can be transferred from place to place in different forms.

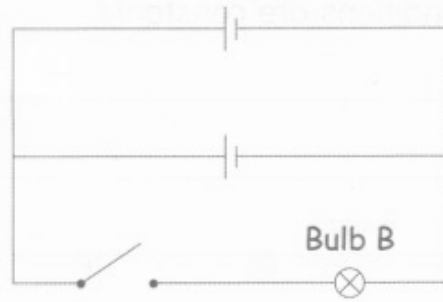
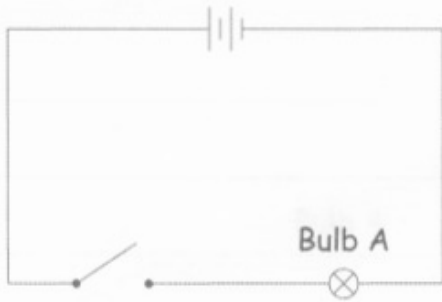
**SUCCESS CRITERIA 1:**

**Give examples of energy transformations in simple appliances.**

**ACTIVITIES:**

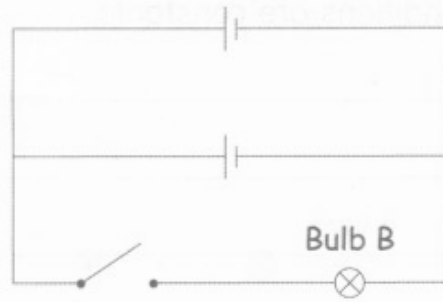
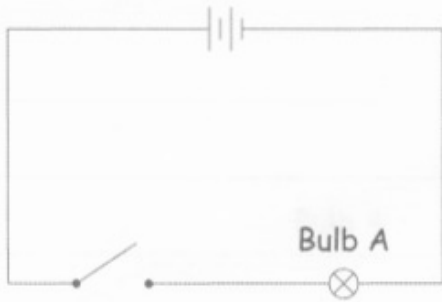
Let pupils name an appliance. State the energy used in the appliance and also the energy conversion in such appliance, for example: Iron → electrical energy used conversion to light and heat. Let them state the useful energy and the waste energy in each case. Example useful energy – heat, wasteful – light: radio → electrical energy → sound, light, heat. Useful energy – sound, wasteful energy – light and heat etc.

Let pupils investigate the relationship between the brightness of a light bulb and the arrangement of dry cells in an electric circuit (see activity 7.5, page 90 – 91, and workbook 5, Let's Learn Science) You will need two similar light bulbs (penlight), 2 switches, 4 similar dry cells, 8 wires (each with crocodile clips on both ends). Set up the circuits as shown below.



1. Close the switch in each circuit.
2. Compare the brightness of the bulb in each circuit. Which bulb shines more brightly?
3. Which variables are kept constant in this activity?
4. Which variable is changed?
5. What is the relationship between the brightness of a light bulb and the arrangement of dry cells in an electric circuit? (Assume that all other conditions are constant.)
6. OPTIONAL: Predict what will happen if the switches in both circuits are closed and the bulbs are left lighted.
7. After making your prediction, close the switches in both circuits at the same time and leave the bulbs lighted. Record your observations
8. What can you conclude from your observations?

Let pupils investigate the relationship between the brightness of a light bulb and the arrangement of bulbs in an electric circuit. You will need 4 similar light bulbs, 2 switches, 4 similar dry cells, 12 wires (each with crocodile clips on both ends). (See activity 7.6, page 92 – 93, workbook 5, Let's Learn Science). Set up the circuits as shown below.



1. Close the switch in each circuit.
2. Compare the brightness of the bulbs in each circuit. Which bulb shines more brightly?
3. Which variables are kept constant in this activity?
4. Which variable is changed?
5. What is the relationship between the brightness of a light bulb and the arrangement of bulbs in an electric circuit? (Assume that all other conditions are constant.)



**UNIT 4:**

**AGRICULTURAL PRACTICES**

**ATTAINMENT TARGET 4:**

**AGRICULTURE SCIENCE**

**SESSIONS:**

(8 – 10)

**LEARNING OUTCOME 1:**

Develop an understanding of some types of soil and their importance to agriculture

**SUCCESS CRITERIA 1:**

**List and discuss some types of soils**

**ACTIVITIES:**

Let pupils list and describe soil samples based on their texture: soil (sandy, clayey and loamy). Place pupils in small groups of 4 – 5, give them a sample of soil. Let them describe the soil sample (coarseness, fineness, colour and clumpness (whether the particles stick to each other when pressed together)) and record the information in their note books.

Take pupils to the school garden or agriculture station. Let them collect soil samples. Let pupils feel the various samples of soil between their fingers and give them the names of each (if it is rough/gritty, it's a sandy soil, if it's sticky, it is clayey, if its firm, clumps and is smooth, it's loamy. Let them make a presentation to the class, by describing their observations.

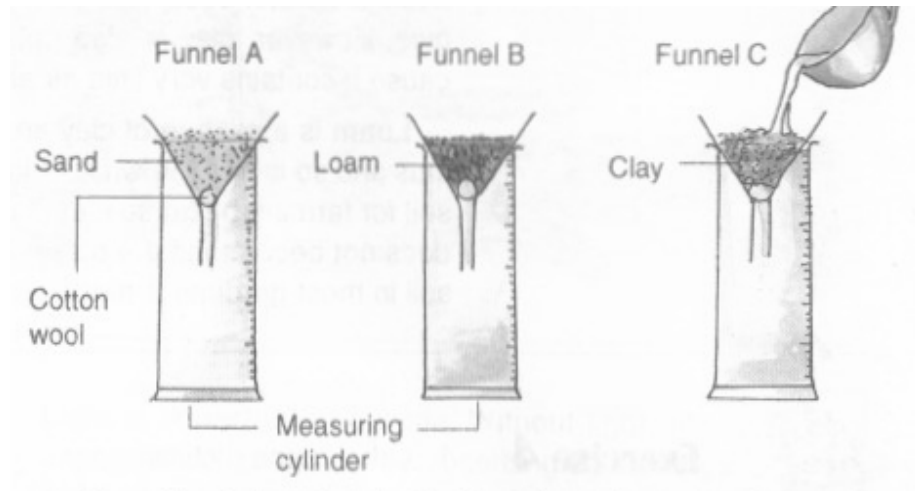
**SUCCESS CRITERIA 2:**

**Observe and discuss some different types of soil.**

**ACTIVITIES:**

Let pupils observe the drainage effect of various types of soils. Place them in small

groups. Give pupils a soil sample (clay, sand, loam - use funnel, filter paper, measuring cylinder/beaker or plastic or Styrofoam glass). Let them set up the experiment as below.



Let them record their observations and discuss their findings (pupils may use the soil samples in the jars for this activity, (see New Modern Science, page 29.)

1. Take three funnels A, B and C of the same size and plug them lightly with cotton wool.
2. Put equal amounts of sand, loam and clay in funnels A, B and C respectively.
3. Place each of the three funnels on the top of a measuring cylinder.
4. Pour 20 ml of water into the funnels at the same time and note the time taken for the first drop of water to fall into the cylinder for each soil sample.
  - (a). Through which soil does water drain the fastest?
  - (b). Through which soil does water drain the slowest?
5. Then leave the set up for a day for all the water to drain out from the soil. Measure the volume of water

eventually drains out for each type of soil.

- (a). Which soil retains the most amount of water?
- (b). Which soil retains the least amount of water?
- (c). which soil retains suitable amount of water for plant growth?

Let pupils research which types of plants are best suited for a particular type of soil and share the information with the class.

Let pupils carry out experiment to distinguish soil type. Observe various soil samples. What is the colour of each soil sample?

(1). Touch each soil sample. How does it feel? Is it rough, coarse, fine, smooth and sticky?

(2). Observe the size of the particles (large grains, medium grains, small or very fine) in each soil sample with a magnifying glass.

(3). Record your observation as follows:

Soil Type	Particle Size	Colour	Texture	Structure
Gravel	Very big	Greyish brown	Rough	Particles are separated from each other
Sand	Big	Grey	Gritty	Particles are difficult to stick together
Clay	Very small	Reddish brown	Very fine	Sticky

Loam	Small	Dark brown	Fine	Clump like
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**SUCCESS CRITERIA 3:**

**List and discuss factors causing soil erosion**

**ACTIVITY:**

Let pupils discuss factors causing soil erosion (water, wind, etc) and discuss how this is done. Share the findings with the whole class)

Let pupils investigate the effect of water on soil erosion – materials – soil samples and water: Get pupils in groups outside with a container of water in each group. Ask them to build mounds of soil. Instruct them to throw their supply of water on the mounds of soil. Get them to describe what they observe.

Let the pupils build small, lighter mounds of soil and blow across them.

Inform them that the action of soil being washed or blown away is called erosion.

Let them conclude that factors that cause erosion are:

- (1) water
  - (2) wind
  - (3) in temperate areas, glacier sheets of ice
- See Caribbean agriculture, book 2, page 18.

Build mounds with dry fine particles of clay or sand. Use a piece of cardboard or small exercise book to make a breeze or wind. Observe and record.

Let them infer that soil is lost by the action of wind. Conclude that this is also soil erosion.

**GRADE 6**

**TERM 2**

**SUBJECT SUMMARY**

**KEY STAGE 2**

**SESSIONS**

**UNIT 5:**

**6-8**

**PLANTS AND ANIMALS**

**AT 1:**

**LO 2**

**SUCCESS CRITERIA:**

**(1 – 3)**

**UNIT 6:**

**10-12**

**RESOURCES**

**AT 2:**

**LO 2**

**SUCCESS CRITERIA:**

**(1 – 5)**

**UNIT 7:**

**8-10**

**FORCES**

**AT 3:**

**LO 2**

**SUCCESS CRITERIA:**

**(1 – 4)**

**UNIT 8:**

**10-12**

**CROPS**

**AT 4:**

**LO 2**

**SUCCESS CRITERIA:**

**(1 – 5)**

**TERM 2**

**GRADE 6**

**UNIT 5: PLANTS AND ANIMALS**

**ATTAINMENT TARGET: LIFE SCIENCE**

**SESSIONS: 6 – 8**

**LEARNING OUTCOME 2:** Investigate the factors which influence the size of plants, animals and human population and make recommendations

**SUCCESS CRITERIA 1:** **Observe and compare the size of a population in different habitats. For example fish in river, ants on tree stem, birds on tree branches**

**ACTIVITIES:** Using the following information given below, let the students draw a graph to represent the information gathered.

Population census over a five year period and answer the following questions, this activity is only an example.

1990	1991	1992	1993	1994
60 000	63 500	65 000	67 500	66 000

- Which year was the population the highest?
- Which year was the population the lowest?
- What are the factors that can contribute to an increase of population?
- State 2 factors that can cause a decrease in population?

Give students a quadrant 1m x 1m or just mark out the area for them using a rope or a metre rule. Let them place it in different spots in their school yard,

garden or somewhere close to the school. Let them count the number of organisms found in the area chosen. Compare their findings and account for the increase or decrease in the organism population. (Students should compare same population species. For example ant population in school garden to ant population behind the school etc)

Let pupils observe a flowering tree and a non-flowering tree in their school surrounding. Observe the number of birds on each tree. Let them explain or account for the number of birds on each tree. Let them write their conclusion in their note books. For example the flowering tree is expected to have more birds than a non-flowering tree because the nectar of the flowers will attract insects such as bees which in turn will attract the birds creating a food chain on the flowering tree.

**SUCCESS CRITERIA 2:**

**Research factors which affect the population in a given habitat**

**ACTIVITIES:**

Let pupils use the internet or other resource to find what are the factors that affect the population of a community. (Rate of birth, death etc)  
Let them make a presentation to the class.

Let pupils find out the number of deaths and births and migration in Dominica for the last 5 years. Let them present the data in table and graphs and share them with the class (data may be obtained from the statistical office)

**SUCCESS CRITERIA 3:**

**Explain ways in which these factors (those mentioned above) can affect the size of the population.**

**ACTIVITIES:**

Let pupils explain how death, births, diseases and migration can affect the size of human population.

Natural disasters can have a devastating effect on plants and animal population explain how this can happen.



**UNIT 6:**

**RESOURCES**

**ATTAINMENT TARGET 2:**

**Earth and Space**

**SESSIONS:**

**(10 – 12)**

**LEARNING OUTCOME 2:**

Discuss and explain waste, human's role in causing pollution and the responsibility for reducing it.

**SUCCESS CRITERIA 1:**

**Discuss and define pollution**

**ACTIVITY:**

Take pupils on a walk along the river bank, sea shore, the town/city, or village. Let them observe the things that makes the areas unclean (garbage, smoke, old vehicles, clogged drains etc) Let them record their observation in their notebooks. On returning to the classroom let them discuss their findings and to develop a definition for pollution.

Let pupils use the internet as a resource to collect information on pollution. Let them share their finding with the class.

**SUCCESS CRITERIA 3:**

**Read and discover different ways of disposing of waste materials.**

**ACTIVITIES:**

Let pupils research different ways of disposing of waste material and make a presentation to the class.

Take pupils on a field trip to a landfill. Let them observe the various activities that are carried out there. Let them write a report on their visit.

Invite a land fill technician or an environmental health officer to your school to talk to the students about methods of waste disposal and, (see next page).

Let pupils write a report or design a poster illustrating good practices associated to waste disposal.

Let pupils design posters and plaques to show/illustrate proper waste disposal. Let them display their posters in or out of their classrooms (all over the school)

Let pupils organize and participate in a demonstration at school or in their community highlighting proper waste disposal, the theme for the demonstration can be, 'Help keep your school clean' or 'Protect your environment'

**SUCCESS CRITERIA 4:**

**Participate in a clean up project.**

**ACTIVITIES:**

Let pupils carry out a clean up project at an important area near or at the school. Let them write a report on what they did and its' importance.

Let pupils collect waste materials around their school or other assigned areas. Let them sort them out according to type.

Design a table representing the various types of material and represent the data on a graph, using the above data.

Let pupils predict, and then identify the different types of trash collected.

1. Predict the types of trash that could be found in the school's environment. Write them out in order from the most common to the least common type.
2. Prepare a data sheet as shown below and record your predictions in the right column.

MATERIAL	TYPE	NUMBER
Plastic	Bottles	10
	Cups	3
	Plates	10
	Forks	16
	Spoons	4
Metal	Tins/cans	13
	Forks	5
	Spoons	6
Etc	Etc	Etc

3. Divide the class into small groups. Each group will be given a collecting bag and rubber gloves.

4. Pick up all trash from the school grounds or the vicinity of the school grounds.

5. Spread old newspaper sheets on the classrooms' floors or outside and empty the contents of the bags on the floor.

6. Sort out the items collected and make a list of them. Count the number of each item collected and order the items from the most common to the least common type.

7. Record your findings in the appropriate column on the data sheet, shown above

8. Wash hands after activity. (See Book 6, page 110, New Modern Science), teacher's reference copy

**SUCCESS CRITERIA 5:**

**Plan, carry out and write up an experiment to make polluted water clean.**

**ACTIVITIES:**

Collect a bucket of pond water. Ask pupils if water is pure or polluted/contaminated. Ask them to design an experiment to purify the water.

1. filtration
2. boiling/chlorination

Let pupils carry out a research on the purification of water. They may use the internet or encyclopaedia. Let them write a report and make a class presentation. They may also talk to a water expert or specialist such as a DOWASCO water technician

Take pupils on a field trip to a water purification plant. Let them write a report on the water purification process and present it to the class. They may use diagrams or flow charts to present their information. (N.B. a number of activities are given above you may choose the one which is most adaptable to your school or class situation or design your own class activity implement the success criteria.

**UNIT 7:**

**FORCES**

**ATTAINMENT TARGET 3:**

**PHYSICAL SCIENCE**

**SESSIONS:**

(8 – 10)

**LEARNING OUTCOME 2:**

**UNDERSTAND THAT SIMPLE MACHINES  
TRANSFER FORCES**

**SUCCESS CRITERIA 1:**

**Observe and explain the effects of forces acting  
on various simple machines, e.g. levers and  
inclined planes etc.**

**ACTIVITIES:**

Make a model and study its motion(s).

Materials: An empty box, a length of metal wire (about 2 mm in diameter-hanger wire), a pair of pliers, a jam jar lid (with a smooth round rim), adhesive tape, a pair of scissors, a plastic straw, a ruler, hard cardboard, a thin wooden stick ( to fit loosely through the straw), colouring materials.

1. Position a shoe box narrow side down on a flat surface. Use a sharp object (such as a safety pin, penknife or metal tips of a pair of scissors) to poke a hole on each of the 2 facing wide-sides of the box.
2. Insert a metal wire (hanger wire) through these 2 holes.
3. Use a pair of pliers to bend one end of the metal wire at a straight angle. Attach the jam jar lid to the rod with adhesive tape.
4. Push the lid against the side of the box.
5. Use the pliers to bend the other end of the wire as shown below. This end of the wire becomes the handle of the model.
6. Cut a 5-cm portion from a plastic straw. Tape it to the side of the box as shown below. Make sure that it protrudes slightly from the top edge of the box.
7. Draw or paste a picture on a piece of hard cardboard. Cut out the picture.

8. Turn the cut-out over and attach a wooden stick to it with adhesive tape.
9. Slide the stick into the straw. The stick should touch the edge of the jam jar lid.
10. Turn the handle of the model.
11. How does the cut-out move when you turn the handle?
12. Describe briefly how the handle causes this movement, focusing on the parts of the model involved, their movements and the conversions of motion(s).

**SUCCESS CRITERIA 2 & 3:**

**2 - Operationally define a simple machine.**

**3 – List the parts of a simple machine**

**ACTIVITY:**

Let pupils discuss what a simple machine is. Let them use simple machines such as hammers, screw drivers and bottle openers, then solicit from them a definition of a simple machine (see page 111, Let's Learn Science, Textbook 4- **Simple machines are devices or tools that help us to do work more easily in our daily activities**).

Let pupils discuss the various types of simple machines and their uses e.g. levers, pulleys, wheels, and axles, inclined planes and gears (see pages 111 – 120, Let's Learn Science, textbook 4 and 57 – 67 textbook 5).

Design and construct a device.

1. Get into a group of four
2. Select a topic from the following list: Rockets, walking toys, moving a block on the floor, how earthquakes/sound affect structures, simple pendulum or toy that spins (spinner), etc.
3. Do research on the topic chosen.

4. With information from your research, discuss the following points (where applicable) with your teacher.
- Design of the device
  - Types of motion involved
  - Ways to reduce friction
  - Ways to increase speed and power of the device
  - Improvement
  - Any other issues

(For assessment see pages 120 bk. 4, Let's Learn Science)

**SUCCESS CRITERIA 4:**

**Identify a number of common levers and describe how they make life easier.**

**ACTIVITIES:**

Let pupils use a screwdriver to open a tin of biscuit or Milo or ovaltine, a fork or a spoon can be used to do the same. When the devices are used that way, they are being used as a simple machine known as a lever.

Let pupils discuss and describe a see – saw. This type of lever converts a downward linear motion (of the effort) at one end to a forward linear motion (of the load) at the other end (see the diagram on page 66, textbook 5, Let's Learn Science)

Let pupils discuss and describe how wheel barrows, tongs and crowbars are used as levers. Let them identify the types of motion involved in these devices (rotary or linear motion?) explain. See also screws page 64, Let's Learn Science, book 5.

**UNIT 8:****CROPS****ATTAINMENT TARGET 4:****AGRICULTURE SCIENCE****SESSIONS:**

(10 – 12)

**LEARNING OUTCOME:**

Develop an awareness of the various agents that cause diseases in plants.

**SUCCESS CRITERIA 1:**

**List and discuss some agents that cause diseases in plants.**

**ACTIVITY:**

Get pupils to name a few harmful plants, and insects that they know. Write these on chalkboard. Show them samples/pictures of harmful plants and insects. Write the name of these on the chalkboard.

(Materials: preserved samples of harmful insects, pictures of harmful plants/weeds; school garden)

Let pupils name some agents that cause diseases; bacteria, fungus, virus. Let them discuss the type of damage caused and the agents responsible.

Insects & small creatures	Damage done	Crops
Mole cricket/crickets	cut young seedling, cut and eat leaves of plants	Pepper, cabbage, tomato seedlings
caterpillars	eat leaves of plants	Cabbage and other vegetables
beetles and weevils	bore holes in pods and beans	Cocoa, soy beans, corn,
slugs	affect the bark of plants eat leaves and damage fruits	Pawpaw/papaya, lettuce, passion fruit, etc
etc		



Let pupils categorize harmful plants/weeds as follows:

HARMFUL PLANTS

Weeds	Parasites	Poisonous Plants
nut grass devil grass Railway daisy Sensitive plant, etc, add your own	bird vine dodder moss wild pine	Poison ivy milk weed

Let pupils discuss how these plants are harmful to farmers. (They cost a lot of money to get rid of them as they compete with the farmers' crops for water, nutrients and sunlight)

Take pupils for a walk in the school garden. Let them carry out an activity to eliminate weeds or insects from the garden. Let them record what they did in their science books. They may collect samples of weeds and insects and other harmful organisms in glass jars and place them in the science corner in the classroom.

**SUCCESS CRITERIA 2:**

**Identify at least four major diseases of economic crops in Dominica**

**ACTIVITIES:**

Get pupils to name some diseases and the crops they affect. Write the information in table form on the chalkboard and let the pupils do the same in their note books eg:

Plants/Crops	Disease
banana tomato	leafspot early blight

tomato	late blight
coconut	crown rot, lethal yellowing
grapefruit	scab, tristeza disease
tree crops (mango and citrus)	fumagine (black layer of stems and leaves of fruit trees.)
paw paw	bunchy top/crown rot
tannia	burning leaf disease

Let pupils discuss three (3) ways/methods of controlling plant diseases. (Spraying, mixing seeds with chemicals such as captan and uprooting diseased plants): Write their contribution on the chalkboard and let them copy the information in their note books.

**SUCCESS CRITERIA 3:**

**Describe the symptoms caused by some diseases.**

**ACTIVITIES:**

Take pupils to the school garden. Let them observe various signs of diseases in the garden. Let them describe what they see. On returning to the classroom let them share their experience with the class. Let them record the information in their note books. They may observe brown sports on leaves, soft rotted sports on fruits, yellowing of leaves, powdery materials on leaves/stems/roots, etc.

Invite an agriculture extension officer to the classroom. Ask him to talk on the topic diseases and their symptoms in plants. Let pupils write a report on the officers' presentation. Collect reports for assessment.

Let pupils do a research on disease in plants. Let them make a presentation to the class.

Let pupils visit a farm or agriculture station near their school. Let the extension officer talk to them on plant diseases and their control. Let them write a report and make a presentation to the class.

**SUCCESS CRITERIA 4:**

Identify major pests of economic crops.

**ACTIVITY:**

Let pupils know that pests are rats, and small animals such as birds and wild animals such as maniocou, etc and other harmful animals that damage crops.

Get pupils to name some insects and other animals that cause damage to crops eg:

See activity in SC 1

Animals and Insects	Damage done
birds	eat seeds, fruits
rats	bite fruits, contaminate stored grains
mongoose	eat crops like cane
squirrel	eat grains
bats	eat fruits, cane, oranges
Insects such as weevils	damage seeds and lay eggs in fruits

Place pupils in small groups and take them on a field trip to a farm/plantation or school garden. Let them observe the damage done by pests to crops. On returning to the classroom let them discuss their findings. Let them record the information in their note books. Very good examples are the damage caused by birds to bananas and tomato, and the damage caused by rats to cocoa and coconuts.

**SUCCESS CRITERIA 5:**

**Identify damage done by pests in economic crops**

**ACTIVITIES:**

Let pupils collect damaged fruits from their homes, schools, shop and other places. Let them display them in the classroom. Let them record the damage seen, in their notebooks. Let them identify the pest most likely to cause such damage.

Let pupils visit a cocoa farm. Let them observe the damage to the pods. Let them draw the pods and mark the areas of damage. Let them describe the damage seen and name the animal most likely to cause the damage.

Take a few damaged cocoa pods to the classroom. Place pupils in groups of 4. Let them describe the damage done to the pods. Let them identify the agent or pest that most likely caused the damage. Let them describe a method of control and make a presentation to the class.

**TERM 3**  
**SUBJECT SUMMARY**  
**GRADE 6**

<b>KEY STAGE 2</b>		<b>SESSIONS</b>
<b>UNIT 9:</b>	<b>ADAPTATIONS OF ORGANISMS</b>	<b>4 – 6</b>
<b>AT 1:</b>	<b>LO 3</b>	
<b>SUCCESS CRITERIA:</b>	<b>(1 – 2)</b>	
<b>UNIT 10:</b>	<b>SOLAR SYSTEM</b>	<b>6 - 8</b>
<b>AT 2:</b>	<b>LO 3</b>	
<b>SUCCESS CRITERIA:</b>	<b>(1 – 4)</b>	
<b>UNIT 11:</b>	<b>MATTER</b>	<b>8 – 10</b>
<b>AT 3:</b>	<b>LO 3</b>	
<b>SUCCESS CRITERIA:</b>	<b>(1 – 4)</b>	
<b>UNIT 12</b>	<b>ANIMALS</b>	<b>6 – 8</b>
<b>AT 4:</b>	<b>LO 3</b>	
<b>SUCCESS CRITERIA:</b>	<b>(1 – 3)</b>	

### TERM 3

#### UNIT 9:

#### ADAPTATION OF ORGANISMS

#### ATTAINMENT TARGET 1:

#### LIFE SCIENCE

#### SESSIONS:

(8 – 10)

#### LEARNING OUTCOME 3:

Demonstrate an understanding of the various body systems

#### SUCCESS CRITERIA 3:

**Identify and label the parts of the various body systems (circulatory, respiratory, digestive, excretory, and the central nervous systems)**

#### ACTIVITIES:

Given a model, drawing, specimen or sketch, let pupils name the parts of the circulatory, respiratory, digestive, and excretory and central nervous system

Place pupils in small groups and let each group name the parts of one of the following body systems; circulatory, respiratory, digestive, excretory, and the central nervous system. Let them make a presentation to the whole class.

Let the pupil write a short story entitled ‘The food journey’ or ‘Waterworks’. Use the Big book entitled the Human body by Penny Cortman and Rachel Sparks Linfield available at the Curriculum Unit

Divide pupils into small groups of 4. Have each group use local available material to make a model of some of the body systems (digestive, circulatory, and respiratory)

#### SUCCESS CRITERIA 2:

**Describe the effects of various drugs (alcohol, tobacco, antibiotics, cocaine, marijuana etc), on the body systems**

## **ACTIVITIES:**

Place pupils in small groups and let them define the term 'addiction' and name some drugs used in Dominica which causes addiction. Let them share their information with the whole class.

Let pupils carry out a project on the effect of a particular drug on the body. The projects should include: statement of the problem to be investigated, gathering of data, presentation of results, logic of deductions, and observation of patterns. Assess pupils on their contributions to group work.

Given a list of drugs, let pupils group them according to depressants, stimulants, hallucinogens antibiotics. Drugs such as alcohol, tranquilizers and sleeping pills are depressants. Velum is a tranquilizer. Stimulants include cocaine, caffeine, nicotine etc. Hallucinogens include marijuana and B.S.D

Let pupils look at a documentary on the effects of a particular drug on the body or invite an officer from the drug unit to talk to pupils. Discuss afterwards after. Pupils take notes.

**UNIT 10:**

**SOLAR SYSTEM**

**ATTAINMENT TARGET 2:**

**EARTH AND SPACE**

**SESSIONS:**

**LEARNING OUTCOME:**

Research the solar system in space

**SUCCESS CRITERIA:**

**Name the planets of the solar system and describe some of them**

**ACTIVITIES:**

Using encyclopaedia, books and/or the internet, research the planets of the solar system. Draw a table showing the planets in alphabetical order, distance from the sun and diameter in thousands of kilometres. (See page 175 of Bright Ideas book 6)

Divide pupils into groups of fours. Let them make or design a model of the solar system and describe their model to the class.

Where possible show a documentary film or a computer simulation activity from the internet, (See [www.nasa.org](http://www.nasa.org)) depicting the use of telescopes at space stations (NASA). Pupils write short report.

**SUCCESS CRITERIA 2:**

**Research exploration of the moon in terms of findings, movements, living conditions in the rocket.**

**ACTIVITIES:**

Divide pupils into small groups. Let them use books, videos, internet, magazines etc to collect data about the moon and life aboard a space ship. Let them make a presentation to the class. Grade students for quality of information and participation in the activity.

Use pupils' data to compile two (2) booklets – Living in a Rocket, and what we know about the moon.



**SUCCESS CRITERIA 3:**

**Research and discuss advantages of satellites to humans**

**ACTIVITY:**

Let pupils research the advantages and disadvantages of space exploration to human beings: Divide into small groups. Let them present the information as a group, some groups should research advantages, and the others to research disadvantages.

Let pupils debate the topic that “space exploration has been beneficial to human development”

Make a collage or poster depicting space travel from then to now as a group activity.

Let pupils find out who was the first person or persons to travel to space, their nationality and the spaceship used. The names of two Spaceships? The year that the first astronauts landed on the moon, who were they, their nationality. (This information can be obtained from the internet)

**UNIT 11:**

**MATTER**

**ATTAINMENT TARGET 3:**

**PHYSICAL SCIENCE**

**SESSIONS:**

**(8-10)**

**LEARNING OUTCOME 3:**

Classify changes as reversible and non-reversible.

**SUCCESS CRITERIA 1:**

**Identify and describe some changes to substances that are reversible and changes that are not.**

**ACTIVITY:**

Dissolve salt and sugar in a small quantity of water in two different containers: Boil the solutions till the water evaporates. Make observations. Record, then discuss.

Identify which mixtures are suspensions and which can be fully dissolved in water.

Materials: You will need teaspoon, glass, salt, water or sugar.

1. Get a glass of water (1/3 filled). Add a teaspoon of salt or sugar to the water. Then stir the mixture with the teaspoon. Describe what happens to the sugar or the salt when you mix it with water.
2. Taste the mixture. Does the mixture taste salty or sweet? Where has the salt or sugar gone to?
3. Leave the mixtures for a while, then examine them. Are they clear mixtures with no sediments or visible particles? Are the mixtures solutions? A solute which \_\_\_\_\_ completely in a solvent forms a \_\_\_\_\_.

Get a Glass of water. Add a teaspoon of wheat flour in the water. Then stir the mixture with the teaspoon.

1. Has the flour completely disappeared in the water?
2. What can you see suspended in the water?
3. Leave the mixture for a while, then examine it.
4. Draw what you see in the class, label your drawing.

5. Do you observe a layer of sediment formed at the bottom of the glass?
6. Is the mixture a suspension?
7. A solute which does not \_\_\_\_\_ completely in a solvent forms a \_\_\_\_\_.
8. Do this activity in groups.
9. Get ten similar glasses. One third fill each glass with water.
10. Add the following substances to each glass ( brown sugar, milk powder, soil, starch, talcum, powder, sawdust, coffee powder, crushed chalk, fine sand, and cocoa powder) and observe what happens.
11. Record your observations.
12. Complete the table below with your observations.

Substances which form solution with water	Substances which form suspension with water

Boil an egg until it is hard, observe what happened. Break an un-boiled egg and Compare the difference between the boiled Egg and the un-boiled egg. Is the process reversible or irreversible?

**SUCCESS CRITERIA 2, 3, and 4: 2: Identify a production process taking place in the home.**

**3: Draw a diagram to show stages in the process.**

**4: Classify some of the changes taking place as reversible and irreversible in the process identified.**

## **ACTIVITIES:**

Let students identify activities such as cooking, making juice, drying meat, making clothes, frying foods, etc and let them describe what happens or the steps involve in the process and also let them identify the process as reversible or irreversible.

Give pupils a portion of clay and a glass of water. Let them wet the clay and roll it into a ball. Let them state if the process of making the clay ball is reversible or irreversible. (If the original substances can be separated or retrieved after the process is reversed then the process is reversible if the original substances cannot be retrieved then the process is irreversible.

Given a number of various substances ask students to dissolve the same in water or any other available Liquid and ask them to determine or find out whether the resulting mixture is reversible or not. Ask them to design or carryout an experiment to determine whether the process is reversible or irreversible

**UNIT 12: ANIMALS**

**ATTAINMENT TARGET: AGRICULTURE SCIENCE**

**SESSIONS:** 6-8

**LEARNING OUTCOME 3:** Demonstrate an understanding of the importance of the fishing industry to agriculture.

**SUCCESS CRITERIA 1: List different methods of catching fish**

**ACTIVITIES:**

Let pupils identify different methods of catching fish and explain them to the classmates: these should include fish pots, (these traps are made from wire mesh or wood and are placed in selected areas in the river or sea), trawling (catching fish in a huge net dragged behind a ship or boat), dredging (huge baskets are dragged along the sea bed) Long line fishing, (long fishing lines are attached to floats at one end and weights are attached to the line to sink it hooks are attached to baits and are placed at various points along the line)



**SUCCESS CRITERIA 2: Develop a project showing how fishing contributes towards the economic development of their country.**

**ACTIVITIES:**

Let pupils carry out a project showing how the fishing industry contributes towards the development of their country. Pupils should seek the help of the fisheries officers to assist them with the development of their project.

Let pupils develop a collage of various fishing activities carried out in their community or country.

Let pupils collect data from the fishing department for fish 2000-2005. Let them design a line graph and a bar chart to illustrate the information collected. Let them answer the questions: in which year was the catch highest and in which year was the catch lowest. (You may add additional questions).

**SUCCESS CRITERIA 3: Visit a fish landing installation and write a report.**

**ACTIVITIES:**

Take pupils to a fish landing site and let them describe the characteristics of the area. Ask a fisherman or fisheries officer to talk to the pupils on the characteristics or condition of the site before and at present. Things to look for: (locker rooms, outboard motors, wave breakers, fibreglass boats, canoe, slide ways, etc.)

**SAMPLE UNIT PLAN      GRADE 6                      SESSIONS    KS 2**

UNIT 1:      Living things in the environment

LO 1:              Research the changes in an ecosystem that can affect life.

<b>SUCCESS CRITERIA</b>	<b>ACTIVITIES</b>	<b>RESOURCES/ MATERIALS</b>	<b>ASSESSMENTS</b>
<p>1. Identify and discuss some ways in which an ecosystem can change</p>	<p>Take pupils on a field trip to observe the effect of deforestation on the ecosystem in their local community and ask them to present their findings to the class. Let them report on the organism that is most likely affected by this change.</p> <p>Or let pupils review the photo entitled ‘soil erosion caused by deforestation’ and the other ‘flooding in the Caribbean on page 107 in Bright Ideas book 6. Let pupils explain what is observed in the photos and the effects this can have on people and other living organism in the area. They should present a report to the class.</p>	<p>Note books, pencils, selected deforested area by teacher</p> <p>Bright Ideas book 6, page 107, pencil note books</p>	<p>Assess pupils for participation and presentation of report</p> <p>Assess pupils through Q And A based on the notes reviewed from the photos.</p>
<p>2. Explain the effect of changes in the environment</p>	<p>Using text book Bright Ideas 5, page 105 as resource, let pupils explain what would happen to the fish life if the pond was drained or the water became polluted by chemicals from a farm or chemical plant.</p>	<p>Text book Bright Ideas 5, page 105 fish pond scenario. Pencils, note books teachers’ explanation</p>	<p>Assess pupils for completion of activity and clarity of answers. Small quiz on unit or Learning outcome.</p>
<p>3. Produce a report that will illustrate different effects of changes in the</p>	<p>Let pupils use the internet or other research resource, such as the encyclopaedia to find out</p>	<p>Internet, encyclopaedia, newspaper, National</p>	<p>Assess pupils for cooperation, participation in group work and</p>

environment	about the green house effect, global warming, earthquakes or droughts. Let them write a report and present it to the class. This can be done as a group or individual activity.	geographic magazine, pencils, paper, and note books	completion of activity.
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## SAMPLE LESSON PLAN

GRADE 6

**Duration:** 60 minutes or 2 sessions

No. of Pupils\_\_\_\_\_

Unit I: living things in the environment

Date:\_\_\_\_\_

**L O I:** Research the changes in the ecosystem which can affect life

**SC:** Identify and discuss some ways in which an ecosystem can change

**Objective:** Pupils will be able to identify and discuss some ways in which an ecosystem can change

### Materials and resources

Selected deforested area, or school surroundings, pictures illustrating landslide in a particular ecosystem can be used.

### Introduction:

Teacher explains to pupils the objective of the lesson and detail to pupils the safety measures to be adopted.

Science process skills to be developed

1-observation          2-communication          3-recording

### Development

1-Place pupils in small groups of 4-5

2- Lead them to the selected area

3-Tell them that they have 15 minutes to identify as many changes as possible to the ecosystem.

4-lead pupils back to the classroom and let them select a recorder and presenter

5-Pupils then discuss in their small groups the changes they observed and the possible effect these changes can have on living things.

6-Groups are given 3 minutes to present their findings to the whole class.

### Conclusion

Selected pupils are called upon to give an oral summary of some of the things learned during the lesson

### Assessment

Assess pupils for participation and presentation of report

