

## **ACKNOWLEDGEMENT**

The Ministry of Education, Human Resource Development, Sports and Youth Affairs through the Curriculum Measurement and Evaluation Unit would like to thank in a very special way a number of schools, Principals and Teachers for their cooperation, and practical involvement in the development of the Science and Technology Program of Study and curriculum guides for Key Stage 2(KS 2).

Special thanks to:

DfID: for its financial contribution toward the development of the curriculum framework and all the associated activities which preceded the piloting of the curriculum guide.

Cambridge group of consultants lead by Mr. John Stewart for his services in making available and managing the DfID funds, and for securing its availability for the financing of the National Curriculum and its associated activities.

Mrs. Lindsay Howard for her critical contribution in supervising and advising curriculum Officers, aided by Principals and dedicated teachers, in seeing that the task could be approached professionally to arrive at a conclusion which reflects the goals and vision of our education system and reflect the values of our society.

Principals and staff of all primary and secondary schools from which teachers were often requested and whose services were solicited at every stage of the curriculum development process. The following teachers who consistently worked along with the Education Officer, Mr. Frank J Newton, must be commended for their invaluable contribution, and these would include; Mr. Andrew Shaw – Principal of Belles Primary, Mr. Alexander Burton of Sineku Primary, Mr. Solomon Pascal - Principal of Grand fond Primary, Mrs. Albertha Peter of Portsmouth Secondary School, Miss Annette Austrie of the Convent High School, Miss Sonia Felix of Bellevue Chopin Primary, Miss. Anthea Felix of St. Luke's Primary, Mr. Jerry Coipel principal of Roseau Primary and Mr. Jeff Jno. Baptiste - head of science department at the Isaiah Thomas Secondary School.

Another group of teachers worked directly on the writing of the Science and technology Curriculum guides for Key Stage two (KS2). Their consistency and professionalism brought the process to the piloting stage. They are Miss. Jacqueline Henderson of Goodwill primary, Miss Nadette Douglass of Grand Bay Primary, Miss. Nadia Laurent of the Roseau Primary, Miss Gloria Angol of Soufriere Primary and Miss Jemima Hill of Newtown Primary.

Of course, special mention must be made of Mr. Nicholas Goldberg head of the Curriculum, Measurement and Evaluation unit for steering and guiding the process in all the subjects to completion by giving valuable advice for and assisting in the planning towards the piloting of the entire process.

The General Editor Mr. Raymond Henderson whose responsibility it will be to produce a final document which will excite all those who come in contact with the same.

And last but not least, the many typists who engaged their typing skills in formatting the finished documents. These would include; Mrs. Margaret Gordon, Miss Florisca Moses, Miss. Christianie Myler, Mrs. Glenda Irish, Ms Doria Honoré. Magdalene Junkere and Sweenda Pascal.

## CONTENT PAGE

<b>CONTENT</b>	<b>PAGE NUMBER</b>
ACKNOWLEDGEMENT	1
INTRODUCTION	4
SUBJECT SUMMARY TERM 1	7
UNIT 1	8
UNIT 2	10
UNIT 3	13
UNIT 4	16
SUBJECT SUMMARY TERM 2	21
UNIT 5	22
UNIT 6	26
UNIT 7	29
UNIT 8	32
SUBJECT SUMMARY TERM 3	36
UNIT 9	37
UNIT 10	40
UNIT 11	41
UNIT 12	45

## INTRODUCTION

While Science is the study of nature, including the biological and physical world, Technology on the other hand, is a method of problem solving which requires all the necessary resources and skills used to gather objective evidence to design and develop gadgets geared towards making life easier and more pleasant.

The Science and Technology curriculum is therefore designed to develop these skills and habits of mind, which are not only directed towards investigating and arriving at plausible conclusions but also towards finding answers to the problems that affect our daily lives. Thus, science education will develop personal strengths, which can be directed in a properly conceptualised 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 attitudes to work.

The Curriculum guide has proposed a number of science activities geared towards helping all students develop their personal strengths. The science and technology activities are also expressed in such a way that they should meet students' social and psychological needs or recognition, affection, security, belongingness and so on. Students will 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, students will enjoy science as a fun activity which includes artistic experiences, creating projects, carrying out investigations that they plan, taking part in science games and contests, recognizing that recreational activities and sports, example basketball, all have science information for students. Students involved 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 the critical importance of that industry in our food security policy. So in order to make sure that our students 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 to meet the needs of society, it is worthy that it be included in the science curriculum and not as a separate subject.

The Curriculum guide is organized in such a way that teachers, students and parents can easily follow it. 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 teachers find it easier teaching from a unit model approach. The teachers must realise that science needs a lot of preparation if students are to gain the maximum from their efforts. No longer should we concentrate our efforts on the above average students. The differentiation of the curriculum in order to address the learning needs of all students should be our foremost goal if we are to comply with the ministry's vision of quality education for all.

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

Thus the strand is further 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 needed for the successful completion of the learning programme. The learning outcomes and success criteria should be seen as a step forward towards a student-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. Students 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 students' interest and give them the opportunity to express these without interruption. This is the way to go. Only this time, we are clearing the misconceptions rising time and time again.

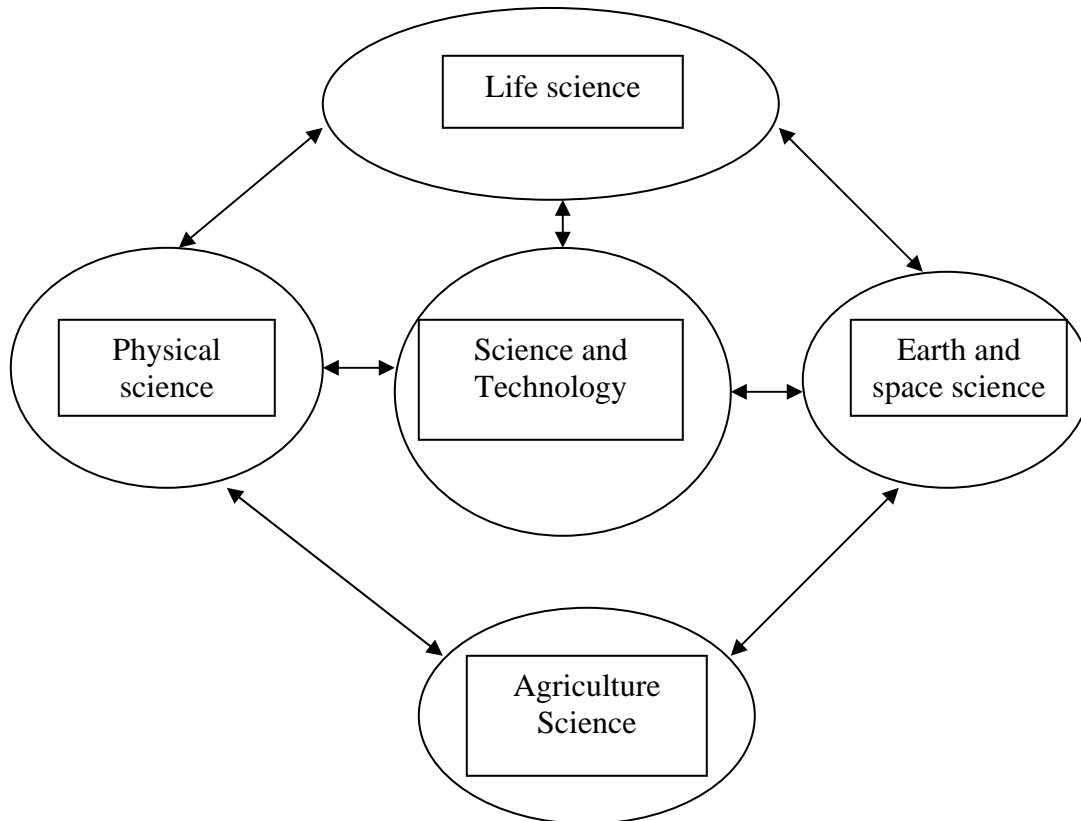
Science and technology are also linked to all the various subjects within the broader curriculum. Here we may mention that the scientific process is the preferred approach to investigating problems within the other subjects. The tools, devices and other gadgets necessary to deliver the other subjects 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 on the scientific development of the students - the former for the measurement and calculation skills and the latter for its broad communication skills which are impacted on all students.

The year summary is broken up into its corresponding term summary, and each is placed at the beginning of each term's activities. The term consists of three (3) or more 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 students 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 students of Grade 2, 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 students develop scientifically. Scientific information is not absolute and may change as we advance because of the advent of new technologies and better approaches. Dominica is a big, well-equipped laboratory and you are called upon to make use of this God-given (natural) teaching tool.

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



# **SCIENCE AND TECHNOLOGY**

## **SUBJECT SUMMARY**

### **TERM 1**

### **GRADE 3**

<b>UNIT 1:</b>	<b>LIVING THINGS IN THE ENVIRONMENT</b>	<b>SESSIONS</b>
<b>AT1:</b>	LO 1	6-8
<b>SC</b>	(1-3)	
<b>UNIT 2:</b>	<b>WEATHER AND CLIMATE</b>	
<b>AT 2:</b>	LO 1	6-8
<b>SC</b>	(1-3)	
<b>UNIT 3:</b>	<b>ENERGY</b>	
<b>AT 3:</b>	LO 1	6-8
<b>SC:</b>	(1-3)	
<b>UNIT 4:</b>	<b>AGRICULTURAL PRACTICES</b>	
<b>AT 3:</b>	LO 1	6-8
<b>SC:</b>	(1-3)	

## **GRADE 3**

### **TERM 1**

**UNIT 1: LIVING THINGS IN THE ENVIRONMENT**

**AT 1: LIFE SCIENCE**

**SESSIONS:** (6-8)

**LO 1: INVESTIGATE THE HABITATS OF LOCAL PLANTS AND ANIMALS**

**SUCCESS CRITERIA 1: Observe the characteristics of at least two habitats (e.g. Mangrove swamps, rainforest, ponds, seashore, rivers, trees etc.)**

#### **ACTIVITIES:**

- Take pupils on a field trip to the beach. Divide them in small groups of 4-5. Let them observe plants and animals on the seashore. Have them describe the characteristics or conditions of the seashore and describe the plants and animals seen. To observe the animals, they may turn over the stones and lift the seaweeds to see the animals under them. Use a magnifying lens to help them see the very small creatures.
- Take pupils on a nature walk through a mangrove swamp. Let them observe the plants and animals that live there. Let them describe some of the plants and animals.
- Take pupils on a field trip to the rainforest near their schools. Let them observe the types of plants and animals most common to this habitat
- Take pupils on a nature walk to a pond or lake. Let them observe the types of plants and animals common to this habitat. Let them record their observations in their note books
- At the end of their trips, let the students discuss their findings in the class. The pupils should be asked to do activities 5.1 in 'Let's Learn Science Work Book page 32, Standard 3. Also see pages 56-63 of corresponding textbook



**SUCCESS CRITERIA 2 & 3: 2: Observe and compare the different habitats mentioned Above.**

**3: Name some organisms that are related to the different habitats mentioned above**

**ACTIVITIES:**

- Using the information from the previous activities let pupils compare between two habitats, e.g. the rainforest and the mangrove swamp, the seashore and the river, the pond and the river, the sea and the river. Let pupils name some organisms that are common to and different from the habitats compared above. (See page 71 of “Let’s Learn Science Book 3)
- Using the internet as a resource, let pupils do a research on the effects of water pollution on the environment or on human.
- Let pupils carry out an experiment to show the effect of litter on marine life (see page 46, activity 5.3 of “Let’s Learn Science, Workbook-Standard 2)
- Take pupils on a nature walk to the (beach/pond, river, rainforest) Pupils will record/observe the different living things they see Discuss their findings (e.g. describe the plants/animals they see) Draw some things that they saw during the nature walk (see pg 39-53 “Let’s Learn Science -Standard 2- Textbook) Pupils will describe the area they have visited
- Present pictures of different habitats – pupils identify the different habitats (e.g. swamp, rainforest) and describe the different habitats orally or let pupils name and classify animals and plants at the seaside, riverside etc). If they are classifying plants let them classify them as flowering or non-flowering plant. If they are classifying plants in the pond let them classify them as surface plants, semi-submerged plants or completely submerged plants. If they are classifying animals let them group them as crustaceans, mammals, birds, reptiles, amphibians.
- Place pupils in small groups of four. Given a list or pictures of various organisms let them place them in the various habitats, (Habitats: mangrove swamps, sea shore, river, rainforest, and ponds,). (Organisms: soldier crabs, sea crabs, tilapia, eels, crayfish, ferns, frogs, tadpoles, cranes, sesserou parrot, sea gull, sand piper, ducks, geese, boa constrictor, manicou, agouti, and wild big.

**UNIT 1: ASSESSMENT**

1. Name the habitat in which these organisms can be found

Parrot, iguana, wild pig, crayfish, perinkle, tadpole, mosquito larva, hydrilla (pond weed), cabomba (pond weed), and snail.

2. A certain habitat contains turtles, octopus, fishes and corals. Name the habitat.
3. Name two things/organisms found in a rainforest
4. Name two things/organisms found in a river
5. In which habitat would one find a starfish

**UNIT 2: WEATHER AND CLIMATE**

**AT 2: EARTH AND SPACE**

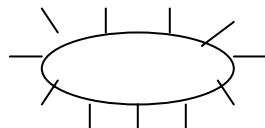
**SESSIONS: (6-8)**

**LO 1 COMPARE WEATHER CONDITIONS IN DIFFERENT PARTS OF DOMINICA**

**SUCCESS CRITERIA 1: Discuss what is weather?**

**ACTIVITIES:**

- Brainstorm with pupils what is weather. A weather report obtained from one of the following places can be brought to the classroom and the teacher or chosen students can read it out to the class. A concept map can be used to note what pupils key words about what weather is



(concept map space)

- Make a model weather station in Science corner to include a rain gauge, wind vane and a thermometer. Let pupils state in their note books what

each instrument is used for. Ask students to share their notes with the whole class.

**SUCCESS CRITERIA 2: Discuss the weather conditions in different parts of Dominica**

**ACTIVITIES:**

- Allow pupils to view video showing forest/plants etc in different parts of Dominica or;
- Present pictures showing plants/forest in different parts of Dominica and let pupils discuss the parts of Dominica where such plants are most likely to grow.
- Discuss the differences or similarities in vegetation in the central part of Dominica-Pond Case area and the West Coast between St. Joseph and Colihaut Teachers may choose to let pupils discuss weather conditions in their school location and any other part of Dominica with which the pupils are familiar (Give reasons for similarities/differences) – (differences in weather conditions)
- Allow students to compare temperature and other data of weather conditions such as rainfall, at two different locations (e.g. an open area and a shaded area)
- Discuss how weather varies in different locations in Dominica

**SUCCESS CRITERIA 3: Distinguish between weather conditions by examining simple weather charts or reports**

**ACTIVITIES:**

- Make a weather chart using rainfall data pre-recorded by the teacher or from information obtained from the internet or the television.
- Listen to weather reports and record and share information with class.
- Let them pretend to be meteorologist and give simple weather reports
- Group students to record their observations of weather conditions for a week using weather symbols to graph or chart the information.

**UNIT 2: ASSESSMENT**

1. List three words that can be used to describe the weather on a particular day
2. Underline/tick the most correct word

The weather/whether is the condition of the atmosphere at a particular time and place.

3. The weather report for the day states that it will be rainy and windy for the entire day. Select the correct activity that is most likely to be done
  - (a) play in the field
  - (b) go to the beach
  - (c) remain indoors and read a book
  - (d) wash some clothes
4. Name a village in Dominica where the villagers usually feel cold at nights
5. Name an area in Dominica which is very dry and receives low rainfall
6. Study the weather chart and answer the questions below:

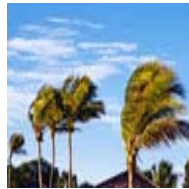
Monday



Tuesday



Wednesday



7. On which day would you do your washing?
8. Which day would be a cold day?
9. When would you use an umbrella?
10. Describe what happens on a rainy day

**UNIT 3: ENERGY**

**AT 3: PHYSICAL SCIENCE**

**SESSIONS:** (6-8)

**LO 1: INVESTIGATE FUELS AND THE SUN AS SOURCES OF HEAT AND LIGHT ENERGY**

**SUCCESS CRITERIA 1: Discuss and identify natural and man-made objects that emit heat and light**

**ACTIVITIES:**

- (Get a variety of materials and display them in the classroom). These may include candles, lenses, mirrors, wood, stone, flashlight, and cigarette lighter, bulbs of various types- penlight, florescent lamps, and picture of the sun, moon, stars and matches. Let pupils group these materials under two headings those that emit light and those that do not emit light. Let them discuss what causes them to produce light. (In the case of the sun, moon and stars it is the abundance of heat, the matches- phosphorus chemical, the flashlight-the carbon chemical which is in the battery/dry cell and in the florescent lamps – it is the neon gas and electric energy, candle- the animal/plant grease or fatty substance).
- Let the pupils discuss the importance of solar energy to humans/plants/animals (living things). (The sun produces the energy needed to sustain life on earth. It supports the basic process of photosynthesis through which all green plants produce food for themselves, animals and human beings. Without the energy from the sun there would be no green plants and there fore there would be no plant food. As a result there would be no plants and animals to produce food for man and other animals that depend on the food produced by the plants for survival).
- Discuss how we see other things although they do not emit heat/light (Through the reflection of light from the objects to our eyes we are able to see non-light producing objects. In the dark we are not able to see the objects because there is no light to be reflected from their surface and as a result we are unable to see them).

**SUCCESS CRITERIA 2: Explain the role of the sun as the main provider of heat/light for living things**

**ACTIVITIES:**

- Design an experiment/device to trap solar energy for use in our daily life. (See let's learn Science Work book 2, page 71).

The materials required depend on your experiment or device.

- The teacher will divide the class in small groups of five pupils.
- Teacher will discuss with groups and brainstorm for ideas on designing an experiment/device for trapping solar energy.
- A small box can be used by painting the outside of the box with black paint or paste with carbon paper.
- Use your device to heat water and record the temperature of the water at various intervals.
- Search the internet to look for other device to conduct your experiment.
- List the materials needed to construct the experiment or devise.
- Use the suggestions noted on page 62-63, of Let's Learn Science book standard 2 to guide students when carrying out the experiment.
- 
- Make a chart showing possible effects if the sun did not shine for a week
- Pupils plant flowers leave some in sunlight in school and some in a dark room then observe over a week. They should write a report describing both sets of plants in their respective conditions and present it to the class for discussion.
- Let pupils make a list of the use solar energy in everyday life. (See pages 67-71, let's learn Science textbook standard 2).

**SUCCESS CRITERIA 3: Discuss examples of fuels used in their country (Dominica)**

**ACTIVITIES:**

- Let the pupils list the various materials used as fuels and state the characteristics of each fuel source listed.
- (Content-For example in the rural areas a lot of wood is used to cook. It is obtained from the forest which leads to deforestation and can cause erosion of uncovered soil on hillsides. In the towns and suburban areas imported liquid-gas is used. This is known as LPG's-liquid petroleum gas and it is propane gas used for cooking. In the welding shops acetylene gas is used with oxygen to weld materials together. For lighting of lamps and also for limited cooking kerosene

a liquid which is another petroleum product is used. Gasoline is used to move cars and other vehicles. Diesel is also used mainly for heavy vehicles such as caterpillars and trucks. Charcoal made from wood is also used in both the rural and suburban areas).

### **UNIT 3: ASSESSMENT**

1. State two man-made objects that produce light (candle, sun, moon and flashlights)
2. Name two natural sources of light – (the sun and stars)
3. Classify or group these objects according to whether they give light or do not give light (candle, lamp, flashlight, duster, tree, stone, and sun)
4. Underline the correct word:  
Solar energy is produced by the (sun/moon)
5. List two uses of solar energy by humans
  - 1 - provide light
  - 2 - provide heat/warmth
  - 3 - heat water
6. Write a sentence about the importance of the sun to living things.
7. Which vitamin is produced by the sun?
8. Name three types of fuels used in Dominica and their use
  - 1 - petrol /gasoline– for moving vehicles
  - 2 - diesel - for moving vehicles and producing electricity
  - 3 - LPG – for cooking
  - 4 - kerosene- cooking and lighting
  - 5 - charcoal – for cooking

## **UNIT 4: AGRICULTURAL PRACTICES**

**AT 4: AGRICULTURE SCIENCE**

**SESSIONS:** (6-8)

**LO 1:** INVESTIGATE THE CONDITIONS NECESSARY FOR THE GERMINATION OF SEEDS.

**SUCCESS CRITERIA 1: List conditions necessary for germination**

### **ACTIVITIES:**

- Let pupils brainstorm the condition necessary for the germination of seeds. Teacher writes the information on the chalkboard and let students discuss the various conditions stated. They should conclude that in order that seeds germinate they must have warmth, moisture and air.

- **Observing germination,**

**Materials needed:** Ten red beans, and Ten corn grains, a shallow container, dampened tissue paper or cotton wool and a tape measure or ruler.

- Soak the five red beans and the five corn grains in water overnight.
- Next day place them on dampened tissue paper or cotton wool in a shallow container. Observe them for a week to see what happens.( see students germination record sheet).
- Record the information collected in your note book. Add some drawing to help show what happened.
- Keep daily records of the appearance of the stem, roots and cotyledons for about 10 days. You may have to remove each seedling from the container in order to observe it. Do so carefully.
- From your records answer the following questions:
  1. How long did it take for each seedling to sprout or germinate?
  2. Did the beans germinate or grow at the same rate as the corn?
  3. What part of the plant grew faster?
  4. Do the bean and corn seedling have the same parts? Name them.
  5. Why do you think the root develops before the shoot?



# Seed Germination - Student Record Sheet

Name(s)

Type of Seeds Used.

Date & Time Experiment Began.

Average Classroom Temperature \_\_\_\_ day \_\_\_\_ night

Type of light: \_\_\_ Sunlight \_\_\_ Artificial light \_\_\_ No Light

# Hours/day plants exposed to light.

## Observations of Seed Germination

SEEDS	Day 1	Day 2	Day 3	Day 4	Day 5
Seed 1					
Seed 2					
Seed 3					
Seed 4					
Seed 5					
Seed 6					
Seed 7					
Seed 8					
Seed 9					
Seed10					



Let pupils name the different parts of the germinating seed in the picture above. How many cotyledons does such a seed have?

### **SUCCESS CRITERIA 2: Investigate the effects of moisture, air and warmth on germination**

#### **ACTIVITIES:**

- Let pupils carry out an experiment to investigate the effect of **moisture** on germinating seeds.
- **Material needed:** 6 kidney beans/cow pea/pink bean/castor oil seeds, tissue paper, water, and 2-clear jar/glass.
- Soak the seeds in water overnight. The following day in your science class place 3 of the beans/ seeds in the jar with moist tissue paper and the other 3 beans/seeds in another jar with dry tissue paper.
- Place the two jars in the science corner or on the window's edge and keep wetting the moist tissue while maintaining the other jar with the dry tissue free from moisture.
- Record your observation by noticing which set of seeds germinated.
- To carry out an experiment to investigate whether **air** is necessary for germination.
- Place two sets of beans or seeds in two different clear/glass jars.
- Fill one jar with water so that the seeds are completely submerged and the other jar should only be given a small amount of moisture with tissue/newspaper on which to place the seeds/beans. The pupils will then observe the germination of the seeds and note in which of the jars germination occurred. They may choose to design their own experiment to strengthen the information obtained from the first test.

- Test to investigate the effect of **warmth** on the germination of seeds/beans.
  - Put three beans/seeds in a clear jar with moist tissue paper and keep it in you science corner in the classroom. Put 3 other beans in another clear jar with moist tissue paper and place it in the refrigerator. Observe what happens to the beans in the two jars. Which of the conditions favoured the germination of the beans? Estimate the condition in the science corner to be warm, that is, at room temperature, and the condition in the fridge to be cold.

**SUCCESS CRITERIA 3: Record and present the results of the investigation in tables and bar graph.** (See students’ seed germination record sheet)

**ACTIVITIES:**

- Let pupils construct a table to organize and present the information collected in the various experiments mentioned before. Also, they are to present the data collected in bar graph, where possible.

<b>DAYS</b>	<b>OBSERVATIONS</b>
<b>1</b>	
<b>2</b>	
<b>3</b>	
<b>4</b>	
<b>5</b>	

**UNIT 4: ASSESSMENT**

1. Use the following words in bracket to fill in the blanks: (moisture, air, warmth)  
 Seeds need .....,..... and ..... to germinate.
2. A young plant is called a ..... (small tree, seedling, herb).
3. The.....grows upwards and the .....grows downwards (root, shoot, stem).
4. Draw a germinating seed and label the following parts (cotyledons, shoot and root).
5. Explain in your own words what germination is.

6. Design a simple experiment to show that light is not necessary for germination.
7. What part of the seeds provides food to the new seedling upon germination?  
(cotyledons, testa, root, plumule)

## **SUBJECT SUMMARY**

### **TERM 2**

### **GRADE 3**

<b>UNIT 5:</b>	<b>PLANTS AND ANIMALS</b>	<b>SESSIONS</b>
<b>AT 1:</b>	LO 2	6-8
<b>SC</b>	(1-3)	
<b>UNIT 6:</b>	<b>RESOURCES</b>	
<b>AT 2:</b>	LO 2	8-10
<b>SC:</b>	(1-3)	
<b>UNIT 7:</b>	<b>FORCES</b>	
<b>AT3:</b>	LO 2	6-8
<b>SC:</b>	(1-4)	
<b>UNIT 8:</b>	<b>CROPS</b>	
<b>AT4:</b>	LO 2	6-8
<b>SC:</b>	(1-3)	

## TERM 2

### GRADE 3

**UNIT 5:** PLANTS AND ANIMALS

**AT 1:** LIFE SCIENCE

**SESSIONS:** (6-8)

**LO 2** DESCRIBE AND EXPLAIN PLANT REPRODUCTION USING COMMON PLANTS

**SUCCESS CRITERIA 1:** Discuss and describe sexual and asexual reproduction in plants

**ACTIVITIES:**

- Use a Hibiscus flower to name and identify parts of a flower
- Use each part of the flower to explain sexual reproduction in plants
- Get a resource person to talk to pupils on how they grow sugar cane, banana and the type of reproduction it entails. (Take pupils to the school garden if there is one and identify plants that grow sexually and those grown asexually. For example sexually-coconut, mango-long, all grasses, almond, ochra, pawpaw, most vegetables, sorrel; asexually- banana, dasheen, tannia, breadfruit, rose, anthurium, lily, plantain, hibiscus, cane, Julie mango, tangerine, grape fruit, yams, water cress, sweet potatoes, etc.). Teacher may also visit a nearby farm or the school surroundings to facilitate the lesson.
- Discuss differences in sexual and asexual reproduction (In sexual production two different gametes a male and a female must join together- pollen cell and the ovule, seedlings may differ from parent plant in terms of crop size (yield) and quality, one may not get the required quality of seedling that is needed. In the case of asexual reproduction: seedlings are exactly like parent plant, crop yield or size and fruit and food quality are maintained.

## **SUCCESS CRITERIA 2:**

### **Classify plants as flowering and non-flowering**

#### **ACTIVITIES:**

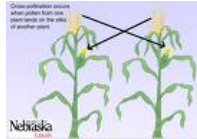
- Allow pupils to observe and collect plants around the school – e.g. (hibiscus, the local Caribbean pine known as the Christmas tree, rose, ferns etc). Let them describe the differences between the two types of plants.
- Place pupils in small groups and let them do a project on flowering and non- flowering plants. They may choose one plant from one of the groups and find out the type of root system, type and colour of flower, type of fruits dry or fleshy, type of plant (herb, tree, and shrub), and type of stem branched or not branched. Type of leaves (simple, compound, small, large, thick, spongy). Type of veins (parallel or netted). They should also produce a drawing or picture of the plant.
- Let pupils discuss the similarities and the differences between flowering and non-flowering plants (Flowering plants like non-flowering plants have roots, stems and branches-flowering plants have flowers non-flowering plants do not have flowers. Non flowering plants like the ferns and mosses have short and soft stems. Flowering plants usually have a varied set of stems from jointed like grasses to long ones with nodes and branches. Flowering plants bear fruits with seeds where as non-flowering plants produce structures called cones with no fruits.

## **SUCCESS CRITERIA: 3**

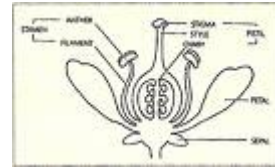
#### **ACTIVITIES:**

- **Study a flowering plant found in the school surrounding**
- Let pupils grow their own plant (one that flowers quickly) cucumber, ochro/ochra, pumpkin and tomato  
Observe its development until it flowers  
Pupils will care for their plant (water etc) and record what they have observed. How long before the plant flowers? What type of flower, is it a single flower or a group of flowers on the same stalk? Are some of the flowers unisexual or do they have both sex organs? State whether the floral parts are attached or separated and the number of ovules in the ovary if possible. In the case of the anther find out if it is attached to the base of the pistil or if it is attached to filaments that are then attached to a central stalk like the hibiscus.

Explain the process of pollination to the pupils. Let pupils know that pollination can be self pollination, and cross-pollination.



Cross pollination



Self pollination

- Students should note that during self-pollination pollen from the same flower is transferred to the stigma of the same flower. In the case of cross-pollination, pollen from the anther of a flower is transferred to the stigma of another flower of the same plant species, (see above diagrams).
- Let pupils bring a flower to the classroom (hibiscus/ periwinkle/ oleanda/ butter-cup). Let them separate the floral parts and identify them. They should draw each part, write a small description of each and state the function of each part. (Let them use a hand lens). Let them complete the table below.

**IDENTIFICATION, DISCRPTION AND FUNCTION OF FLORAL PARTS**

<b>FLORAL PARTS</b>	<b>DRAWINGS</b>	<b>DISCRPTION</b>	<b>FUNCTION</b>
STALK			
SEPALS			
PETALS			
STIGMA			
STYLE			
ANTHER			



POLLEN			
OVULE			
OVARY			

**UNIT 5: ASSESSMENT**

1. Draw a flower and label the following parts (sepals, petals, ovary, ovules, stigma, anther, filament and style)
2. Why are the petals of flowers so brightly coloured?
3. Into what is the ovary of a flower developed?
4. Into what is the ovule of a flower developed?

**Fill in the blanks with the correct word:**

5. Growing a plant from a seed is called..... reproduction (sexual, asexual).
6. When a cutting is used to produce a new plant this is called.....reproduction (sexual, asexual).
7. The cane is usually grown using stem cuttings, this is a form of.....reproduction (asexual, sexual).
8. The dasheen plant is usually grown from a corm, this is a form of ..... reproduction (sexual, asexual).
9. The banana plant is usually grown using a sucker, this is a form of ..... reproduction (sexual, asexual).
10. The red bean plants grown using a bean, this is ..... reproduction (sexual, asexual).

## **UNIT 6: RESOURCES**

### **AT 2: EARTH AND SPACE**

**SESSIONS:** (6-8)

**LO 2:** DEMONSTRATE AN UNDERSTANDING OF THE EARTH'S RESOURCES AND THEIR SUSTAINABILITY

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

- **Identify and discuss earth's resource**

#### **ACTIVITIES**

- Let pupils name resources and discuss their importance to living things. These should include air, water, soil, mineral/rocks and trees, etc. Let them state some things that can be obtained from these resources. They should be able to state that a resource is something which can be used to produce other things to benefit humans. Example of resources are, water used for irrigation, in factory, in homes, in school, etc. The sea for fishing and the transportation of goods and persons, the beach is used as a tourism product. The soil, is used to produce food, build houses, recreational facilities as golf courses, tennis courts, make bricks for houses. Minerals for making steel for the construction industry, and other metals for jewellery. The forest is used for obtaining wood, and as an attraction to tourists (eco-tourism), etc.
- Let pupils state more natural things and name the different products that can be obtained from them. They may present their information in the form of a table.
- Allow pupils to set up a science corner with pictures/drawings of some resources and state what these resources are used for (e.g. waterfall, soil). You could also set up with samples of real resources

## **SUCCESS CRITERIA: 2**

- **Classify earth's resources as renewable and non-renewable resources**

## **ACTIVITIES:**

- Let pupils list things that we make use of everyday. (e.g. water, soil, rocks, minerals, trees, gasoline, kerosene, etc)
- Pupils will discuss what those things are used for and which of these we use more often and why
- In small groups let pupils identify the resources that once used cannot be retrieved and those that can be retrieved or can be used over and over again. (For example water can be used over and over again but petroleum is finite and once used cannot be used again. Trees can be used and once replanted can be used over and over again, the same for soil. However, minerals such as silver, gold, and copper etc, with a finite amount available in nature are not renewable. The same goes for petroleum and its products.
- Pupils will discuss the term renewable and non-renewable, (renewable resources that are used over and over again or those that when used wisely remain forever. Non-renewable resources are those resources that when used once are not able to be used again.
- Pupils will explain why we should care even more about our non-renewable resources.

## **SUCCESS CRITERIA: 3**

- **Discuss the use of different resources**

## **ACTIVITIES:**

- Allow pupils to identify one resource and explain and design (if possible) something they can use this resource to do or produce (e.g. – **rocks** for making blocks, houses, for producing minerals (gold/silver) and sea defences, **soil** –for agriculture, bricks, recreational facilities such as golf courses, football fields, clay pots, building roads and for locating or building housing unit).
- Let pupils visit a known industry and let them write a report on the type of resources that are used there and the different products obtained from the resource. State the importance to the country (Dominica) and state whether the products produced are exported or

consumed locally. They should also state in their report whether the resource is renewable or non-renewable. If they cannot visit an industry or facility like a mining firm or an electricity producing plant get them to research an industry of their choice in the encyclopaedia or internet and make a presentation to the class. This can be an individual or group work.

## **UNIT 6: ASSESSMENT**

### **Underline the correct word in the bracket**

1. What part of the air is good for breathing? (oxygen, nitrogen)
2. What part of the air would be used for putting off a fire? (oxygen, carbon dioxide)
3. Which of these is a renewable resource? (air, soil)
4. Plastic is a (man-made, natural) resource.
5. Wood is a (natural, man-made) resource.
6. What is a renewable resource?
7. What is a non-renewable resource?
8. Classify these resources as renewable or non-renewable (petroleum, water, trees, stones).
9. which of these is the most important to human beings? (gold, water, car)
10. Name two resources in Dominica which are used for Dominica to produce electricity.

**UNIT 7: FORCES**

**AT 3: PHYSICAL SCIENCE**

**SESSIONS:** (8-10)

**LO 3:** REALIZE THAT OBJECTS CAN EXERT FORCES ON ANOTHER OBJECT FROM A DISTANCE

**SUCCESS CRITERIA: 1**

- **Observe the effects of magnet and electrical charged objects on the motion of different materials**

**ACTIVITIES:**

- Display a number of objects such as coins, iron filings, grains of sugar, nails etc. Let pupils use magnets to see which will be attracted to the magnets
- Allow pupils to make an electro magnet (use – nail, wire, batteries) and see which materials that would be attracted to the electro magnet (At the end of these activities pupils with the help of the teacher should conclude that magnets exert a force on some substances by attracting them towards the magnet, such force is a pull.
- Give pupils two magnets and let them place the N-N ends towards each other and the S-S ends and the N-S ends towards each other then observe what happens. Let them copy and fill out the following table in their note/lab books.

<b>POSITION OF MAGNETS</b>	<b>WHAT HAPPENED</b>	<b>TYPE OF FORCE EXERTED</b>
N-N	REPELL	PUSH
S-S	REPELL	PUSH
S-N	ATTRACT	PULL

## **SUCCESS CRITERIA: 2**

- **Classify substances as magnetic and non-magnetic**

## **ACTIVITIES:**

- Give pupils various objects and a magnet; let them determine which are magnetic and which are not.  
Allow pupils to discuss their findings for the experiment above.  
Let pupils classify the materials as magnetic and non-magnetic.  
Pupils will discuss why some materials are magnetic and others are not.
- Let pupils discuss the importance of magnets. (Separate mixture, help doctors to remove iron filings/small pieces of metals from the eye during surgery, closing of fridge doors, for use in radio speakers, etc)

## **SUCCESS CRITERIA 3:**

- **Observe different kinds of motion and indicate whether the motion is caused by magnetic, static electricity, gravity or applied force**

## **ACTIVITIES:**

- Let pupils pull and throw different objects and then state the type of force involved.
- Allow pupils to use a magnet to move sand or iron filings on paper, then state what can of force involve.
- Let pupils use charged hair pin (pass hair pin in the hair) to move objects then state what type of force involve (electrostatic force).
- Pupils will discuss what made the objects move (e.g. duster/other object falling to the floor – gravity).
- Pupils can also observe the magnetic field of the magnet by looking at the motion of the sand on paper when the magnet is moved underneath it, and then state the type of force that create the pattern.

#### **SUCCESS CRITERIA 4:**

- **Demonstrate how a magnet works**

#### **ACTIVITIES:**

- Pupils will discuss the poles of a magnet. (North & South poles)
- Pupils with the help of the teacher will set-up an experiment to identify the North and South poles of a magnet (bar magnet – suspend the magnet in the air). Pupils will allow the magnet to turn and when it stops they will identify the North and South pole according to the direction the magnet is pointing (North or South).
- Pupils will use one marked magnet and the other unmarked to find out the poles of the unmarked magnet. What happens when like poles meet? (North - South attract, North- North, and South-South repels). Pupils will discuss their findings.

#### **UNIT 7: ASSESSMENT**

1. The poles of a magnet are called (north and east, north and south, east and west, south and east) poles
2. Classify these substances as magnetic and non-magnetic (sand, sugar, iron, plastic paper clips, needle, thumb tax, glass, leather, cloth)
3. Explain how an electromagnet is formed.
4. When two magnets are brought together, the north poles (attract, repel) each other.
5. When two magnets are brought together, the south poles (attract, repel) each other.
6. When two magnets are brought together, the north and south poles (attract, repel)each other each other
7. Define the following term: gravity, static electricity, magnetic force.

**UNIT 8: CROPS**

**AT 4: AGRICULTURE SCIENCE**

**LO 2: UNDERSTAND THAT CROPS ARE GROWN FOR DIFFERENT PURPOSES**

**SUCCESS CRITERIA 1:**

- **Identify crops grown in the Caribbean**

**ACTIVITIES:**

- Put up a chart with a variety of crops grown around the world  
Allow pupils to identify and name crops on chart  
In groups allow pupils to identify the crops which are only grown in the Caribbean region. Let pupils fill out a table similar to the one below. The list of crops given to the students should have more than what this table contains. The list should include crops such as, apples, wheat, oats, soybeans, oats, barley, millet, etc.

<b>COUNTRY</b>	<b>CROPS</b>
GUYANA	Rice, bananas, sugar cane
TRINIDAD AND TOBAGO	Sugar cane, bananas, root crops
GRENADA	Nutmeg, bananas, cocoa
ST. VINCENT & THE GRENADINES	Root crops, bananas, cocoa, arrowroot, coconuts
ST. LUCIA	Bananas, root crops
MARTINIQUE	Citrus, bananas
DOMINICA	Citrus, bananas, pineapple, cut flowers, coffee, cocoa, coconuts
GUADELOUPE	Flowers, bananas
BARBADOS	Vegetables, sugar cane
JAMAICA	Vegetables, bananas, coffee, cocoa

- Allow pupils to discuss why these others crops cannot grow in the Caribbean. (They are temperate plants and will not survive the hot climate in the Caribbean)
- Allow pupils to draw some of these crops
- Let pupils identify one crop and research the different stages of production (e.g. banana project: Planting, harvest, marketing)



- Let pupils identify which Caribbean Island produce more of these crops and why (e.g. sugar cane, banana, mangoes)

### **SUCCESS CRITERIA 2:**

- **Group crops according to given criteria (import, export)**
- Let pupils give the definition of the term import/export
- Let pupils identify the crops that we (Dominica) export to other countries and why (export- bananas, grapefruits, mangoes, pineapple, oranges, plantains, vegetables seasoning, ginger, pepper , root crops and ornamentals (Anthuriums, ginger lilies and lucky lily)
- Allow pupils to identify the crops Dominica imports from other countries and why? (Irish/white potatoes, apples, carrots, tomatoes, peanuts, cabbages peas and beans, frozen corn, prunes and raisins, onions, and garlic).

### **SUCCESS CRITERIA 3:**

- **Identify products manufactured from some crops**

### **ACTIVITIES:**

- Take pupils to a factory (e.g. Bello) and allow pupils to see and record the variety of manufactured goods produced there. (e.g. pepper sauce, passion-fruit juice/syrup, guava jelly, grapefruit and lime juice/syrup etc)
- Discuss what was used to manufacture these goods
- Let pupils discuss the importance of manufacturing goods from local products
- Let pupils visit a grocery shop/supper Market and let them list at least 5 manufactured products and the crop or fruit used to produce the same. For example: Guava-guava cheese, jam and juice. Coffee-ground coffee, instant coffee, roasted, coffee bean, etc.
- Allow pupils to think of other products manufactured from crops (e.g. **sugar cane**-brown sugar, white sugar: **cotton**-cloth, thread: **wheat**-flour, whole wheat, baking powder, cream of wheat; **rice**: whole grain, white and brown rice, rice cereal, long grain, and pet rice: cocoa- chocolate, Ovaltine, Roma, Hot Chocolate, Milo, Cocoa Tea).
- Some plants are used as medicinal plants; let pupils find out the names of five plants and the medicinal uses. Here is a list of some medicinal herb/plants used in Dominica.

<b>PLANTS</b>	<b>USES</b>
-man better man /colic weed	Cure for colic, fever, colds, chest pains, nausea, coughs, asthma, and hypertension, in some areas of Dominica it is used as an aphrodisiac. dais
-ven-venn blé/latjé wat	Both the leaves and flowers are used in teas to treat colds, hoarseness and fever, worm medicine; the leaves are crushed and place on wounds and sores. It is also used for treating nervous problem and for easing throat and chest congestion.
-ven-venn latjé blanc	Tea used to control hypertension, diabetes, cold and coughs
cojorik	Leaves are chewed to control toothache and intestinal worms in animals
-bazelik	Tea used for colds and when cool for washing sore eyes
-tabak zonbi	Tea is made from leaves and young shoots used for colds, fever, asthma and rheumatism
-Zéb kouwé	Used for sore throat, and as a cooling, it can also be used in salads
-mézé mawi/ sensitive	Colds, fever, hypertension,
-ponm kouli/ koukouli	Cooling, anti-inflammatory, sore throat
-bois den/ bay leaf	Tea, cold
-chuk-chuk/ Shadon béni	Diabetes, hypertension, gravy seasoning, bowel cleanser, blood purifier
-zouti/ stinging nettle	Boiled leaves used as shampoo/ scalp wash, treat high blood pressure, excessive menstrual flows and urinary problems.

(More plants and their uses can be obtained from the Forestry Department and from the manual “Cabrits Plants and Their Uses” located at that department.

## **UNIT 8: ASSESSMENT**

1. Name five types of crops grown in Dominica.
2. Identify two crops grown in Dominica for export.
3. Name a crop use to manufacture other products in Dominica.
4. Name two products manufactured from the crops named in question 3.
5. Explain why a country must make sure crops are grown and animals are reared.

6. Identify a product which is manufactured from each of these crops:

- cotton
- banana
- sugar cane
- orange
- lime
- passion fruit
- peanut
- sorrel
- grape fruit

7. Name a flower which is grown as a crop in Dominica.

8. Name two crops which produce food above ground.

9. Name two crops which produce food below ground.

10. Classify these crops either as tree crops, food crops, vegetables crops or ornamentals

(dasheen, tannia, banana, yams, tomato, cabbage, lettuce, orange, mango, carambola, coconuts, lucky lily, ginger lily, roses, antherium, potato, cucumber, cauliflower, broccoli, cashew, orchids, crotons)

11. Name two plants used to make tea in Dominica.

12. Name two plants used as medicine in Dominica.

**SUBJECT SUMMARY**  
**SCIENCE AND TECHNOLOGY**  
**TERM 3**  
**GRADE 3**

<b>UNIT 9:</b>	<b>ADAPTATION OF ORGANISMS</b>	<b>SESSIONS</b>
<b>AT 1:</b>	LO 3	6-8
<b>SC:</b>	(1-3)	
<b>UNIT 10:</b>	<b>SOLAR SYSTEM</b>	
<b>AT 2:</b>	LO 3	2-4
<b>SC:</b>	(1)	
<b>UNIT 11:</b>	<b>MATTER</b>	
<b>AT 3:</b>	LO 3	8-10
<b>SC:</b>	(1-4)	
<b>UNIT 12:</b>	<b>ANIMALS</b>	
<b>AT 4:</b>	LO 3	8-10
<b>SC:</b>	(1-4)	

## TERM 3

### UNIT 9: ADAPTION OF ORGANISMS

AT 1: LIFE SCIENCE

SESSIONS: (6-8)

LO3 DEMONSTRATE DIFFERENT WAYS BY WHICH PLANTS AND ANIMALS INTERACT IN THEIR LOCAL ENVIRONMENT

#### SUCCESS CRITERIA: 1

- Identify species in a food chain as herbivores and carnivores

#### ACTIVITIES:

- Take pupils on a nature walk let them make a list of all animals that they have seen (e.g. dog, caterpillar)
- Pupils will discuss their findings in the classroom
- Let pupils describe the animals
- Let Pupils discuss what these animals eat and give reasons for their answers. Let them construct simple food chains using some of the animals observed in the location visited.
- Give pupils a number of organisms and let them construct the respective food chains. (Sea weed-fish larvae-mackerel-whale), (guinea grass-grass hopper-birds-snake), (mosquito larva- fish larva-salmon-shark), (tomato fruit-birds-snake-mongoose), and (grass-cow-man).
- Teacher can put up pictures of animals and point on certain animals (e.g. goat, cow, and sheep, lion, dog, cat, tiger, elephant, agouti, snake, lizard and grasshopper) and state whether they are herbivores/carnivore. (Allow pupils to come up with the meaning of the word herbivore and give other examples).
- Teacher will use the same list and strategy for carnivores. Pupils will determine the meaning of the word carnivore and give other examples (dog, cat).

## **SUCCESS CRITERIA 2:**

- **Describe the types of relationships in which organisms work together or against each other (e.g. parasites)**

## **ACTIVITIES:**

- Allow pupils to name organisms that depend on other animals to survive e.g. (**mosquito** (parasite) sucks blood from human and animals-**Tape worms**-live in the intestines of humans especially children-**ticks and fleas** – live on dogs, cows, cats, goats and other animals) -**Lice**- live on fowls and wild birds, some live on human especially in their hair.
- Let pupils find out the name of the type of relationship where both organisms benefit (**mutualism**) and give an example. The cattle egret and the cow. The cattle egret gets the fleas and ticks as meals and the cow gets a clean up. Bees and flowering plants. The bees get pollen and nectar for their honey comb and hive and the flowers get pollinated. Lady bird beetles and the plants infested with pink milly-bugs. The lady bird beetles get their meal and the trees/plants get cleaned from the infestation.
- Let students use the Internet to research the effects of parasitism in human or animal. They may work individually or in groups and make a presentation to the class. They may study only one parasite.

## **SUCCESS CRITERIA 3:**

- **Explain what happens when any part of a food chain is disrupted or broken**

## **ACTIVITIES**

- Allow pupils to make a list of food they had for breakfast or lunch
- Let pupils identify whether the food came from plants or animals.
- Allow pupils to write up a food chain (e.g. corn – eaten by weevil- eaten by chicken – eaten by man)
- Let pupils discuss what would happen to man if there were no chicken left or if suddenly there was a severe drought and there was no corn for the weevils to feed. Would there be a decrease or an increase in the various populations?

- Allow pupils to imagine what would happen if the population of one of the organism would increase or decrease. Let pupils then discuss their answers.

## ASSESSMENT

### UNTI 9

1. What is a herbivore?
2. What is a carnivore?
3. What is an omnivore?
4. Identify the carnivore, the omnivore and the herbivore in this food chain  
Grass.....grasshopper.....bird.....man.....
5. Identify one producer and one consumer in the food chain above.
6. Name the kind of relationship in which two organisms work together and both benefit.
7. Name the kind of relationship in which an organism totally depends on the other for survival.
8. What kind of relationship exists between a cattle egret and a cow?
9. What kind of relationship exists between a flea and a dog?
10. Construct a simple food chain using the organisms in the bracket  
(grass, man, goat) –  
(cabbage, rabbit, caterpillar)  
(corn, cat, birds, insects)

**UNIT 10: SOLAR SYSTEM**

**AT 2: EARTH AND SPACE**

**SESSIONS:** (2-3)

**LO3 DEVELOP AN AWARENESS OF THE MOON CYCLE**

**SUCCESS CRITERIA: 1**

- **Observe, describe and record the appearance of the moon at different times of the month**

**ACTIVITIES:**

- Discuss the term phases of the moon with pupils
- Use a globe (moon) and flashlight (sun) to let pupils observe why the moon goes through different phases. Pupils will record and discuss their observations
- Allow pupils to research the names of the phases of the moon or relate them if they already know them.
- Let pupils draw the different phases of the moon in the order that they appear during a specific month.
- Pupils will observe – (draw and name) the appearance of the phase of the moon, as observed by them at different times of the month.
- Let pupils make cut outs of the phases of the moon as shown below and identify which picture represent – full moon, first quarter, and last quarter Let them draw enlarged or magnified diagrams of the phases of the moon and put them up in the science corner in their classroom.





## **ASSESSMENT**

### **UNIT 10**

1. Name the different phases of the moon
2. Put the following phases of the moon in proper order:  
(full moon, first quarter, last quarter, new moon)
3. Explain how the moon gets its light.
4. Describe the appearance of the moon at full moon and last quarter

### **UNIT 11:                   MATTER**

#### **AT 3:                       PHYSICAL SCIENCE**

**SESSIONS:**               (8-10)

**LO 3:**                    UNDERSTAND THAT THE AMOUNT OF MATTER AND THE  
SPACE IT OCCUPIES CAN BE MEASURED

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

- **List some physical properties of matter**

#### **ACTIVITIES:**

- Let pupils manipulate different materials (solid, liquid, a blown balloons for gas) to determine the physical properties of matter
- Let pupils use their senses (e.g. touch) to find out about solid, liquid, gases (e.g. put blocks in a container, pour water in a container), pour water on a flat surface to observe what happen. Did it run along the surface or did it remain in one place?
- Let pupils discuss the shape of the materials; whether they occupy space or maintained the same shape when transferred from one container to another with different shapes/sizes. etc)
- Let pupils draw examples of each state of matter

## **SUCCESS CRITERIA 2:**

- **Determine the physical properties of matter by using instruments**

## **ACTIVITIES:**

- Let pupils use a thermometer to determine the boiling and freezing point of water
- Let pupils deep a thermometer in boiling water and then in ice. Pupils will record the reading on the thermometer, and then discuss their observations.
- Let pupils place some butter in a container and leave it in the sunlight until it melts and describe what happens and why. (the butter absorbed heat from the sun and this caused it to melt. The butter moved from the solid state to the liquid state.
- Let pupils place a piece of ice on a dish and observe what happens after a few minutes. Ask pupils whether the ice gained heat or lost heat. In that case the ice gained heat from the atmosphere. The heat came from the sun. Ask them what should be done to change the water back to ice? Was there a loss of heat or heat gain? The water lost heat to the refrigerator? The process is known as freezing. When water freezes it loses heat to form or change to ice and when ice is heated it melts to form water which is a liquid.
- For some substances to melt, they need a lot of heat from a heat source such as a stove or coals or electricity e. g. lead, sugar, and silver etc. Let pupils find out other substances which need a lot of heat to melt and some which will melt at room temperature.

## **SUCCESS CRITERIA 3:**

- **Measure definite volumes and mass of materials**

## **ACTIVITIES:**

### **VOLUME**

- Distribute available measuring instruments and containers among the various groups
- Ask pupils to estimate and measure the capacity of each container and record the results
- Let pupils find the difference between estimated and actual capacity. Note – measuring containers can be made by using syringe to pour water into containers at 5ml or 10ml intervals and marking these on the outside of other containers

- Match box, trays, 30cm rulers a number of regular and irregular solids

### MASS

#### ACTIVITIES:

- Review the difference between mass and weight  
(**Mass amount of matter in the object, weight the effect of gravity on the mass**)

- Distribute objects/substances to be weighed

**Materials:** Wooden/plastic/metallic cube objects, plastic bag of sand/soil/wood shavings shaving, stone, paper clips spring balance. The objects can be placed in small plastic bags with negligible mass to weigh them.

- Review the SI units for measuring mass, (kilogram, gram)
- Give pupils an opportunity to estimate various mass of objects at their stations, then measure with a spring balance to find out their mass.
- Ask them to estimate and measure the various objects in their stations using grams for small masses and kilograms for heavier masses
- Let them record their observations in two columns
- Pupils can find the difference between actual mass and estimated mass

#### TABLE FOR RECORDING MASS OF OBJECTS

OBJECTS	ESTIMATED MASS	REAL MASS

(Note – pupils will use scale/spring balance to measure the mass of object). Each object can be placed in a small ice pop plastic bag to measure its mass.

#### **SUCCESS CRITERIA 4:**

- **List some examples of physical changes**

#### **ACTIVITIES:**

- Let pupils place water in the refrigerator. (Allow pupils to discuss the changes after they have taken it out of the freezer)
- Let pupils discuss how they can get back the water. (Ice to water; freezing and melting are physical changes, because they do not alter the composition of the substance or materials.)
- Let pupils observe a piece of candle melting and discuss how they can get back the candle. (By cooling the liquid-oil by loss of heat or freezing the liquid oil will harden to form solid fat or candle.)
- Teacher and pupils will discuss the term physical change
- Pupils can give other examples of physical change

#### **UNIT 11: ASSESSMENT**

1. List the three stages of matter.
2. State two characteristics of each state of matter.
3. What instrument is used to measure the boiling and melting points of a substance?

#### **Underline the correct word in bracket**

4. Solids change to liquid by (boiling, melting).
5. Liquids change to solids by (freezing, evaporating).
6. Liquids change gases by (evaporating, freezing).
7. Gases change to liquids by (condensing, boiling).
8. A substance with a definite shape is a (solid, liquid).
9. A substance which occupies the shape of a container in which it is placed is a (liquid, solid)
10. A substance which spreads quickly in the air is a (liquid, solid).

**UNIT 12: ANIMALS**

**AT 4: AGRICULTURE SCIENCE**

**SESSIONS:** (8-10)

**LO 3:** USE KNOWN PRACTICES TO CONTROL PESTS AND DISEASES IN ICULTURE

**SUCCESS CRITERIA 1:**

- **Name and describe two ways of controlling pests in plants**

**ACTIVITIES**

- Let pupils discuss how farmers kill insects that destroy their crops. The teacher should guide the pupils to arrive at the proper description of the methods.

**Content-** To control pests in crops, farmers plant/grow other crops that will repel the insects. When growing cabbage farmers grow chive besides the cabbage this repels the insects such as the butterfly that attacks the cabbage crop. Also the farmers may use their hands (manual) to destroy the pests if the crop area is small. Sometimes the farmers spray the crops with a chemical to control and destroy the insect pests. In cases where the pests are birds or rats the farmer may use traps. To control pests in crops farmers use 1. Traps: 2. Manual method (hands), 3. Chemicals also known as spraying: and 4. Biological control, this is the use of plants such as chive and also helpful insects such as lady bird beetle.

- Teacher should guide pupils to identify some insects that affect crops in Dominica and the Caribbean. Use the list below to guide the students.

**LIST OF SOME HARMFUL INSECTS AFFECTING CROPS IN DOMINICA**

<b>NAME AND TYPE OF INSECTS</b>	<b>SYMPTOMS</b>	<b>CONTROL</b>
Leaf eating insects	Cut on leaves	spray
Bachac ants	Feed on young shoots	Apply bait, or spay
Citrus aphids	Feed and damage young shoots, reduce growth	Use ladybird beetles or apply spray with systemic chemical
Black bees	Feed on young shoots	Destroy nests
Scale insects	Feed in clusters on young seedlings	spray with malathion
Fruit fly (mango and guava)	Damage fruits	Spray plant while fruits are small

Ear worm (corn )	Damage young corn cobs	Spray or use wasps as a biological control
Mole cricket	Seedlings eaten during germination or at transplant	Spray
Coconut mite	Brown sports on nuts, fruits reduced in size	Cut down affected trees

**SUCCESS CRITERIA 2:**

- **Describe two ways of controlling weeds**

**ACTIVITIES**

- Let pupils describe ways that weeds are control. Teacher will lead the discussion in the form of a mini lecture and allow pupils to continue with the discussion. Teacher will note information on the board while pupils copy the same on their note books
- Take pupils to the school garden/flower garden and let them weed an area manually, plant it and take care of it. Let them keep a record of the date and the activities that they do in the area.

**Content:** Method of controlling weeds in crops are, **manual-** use of cutlass or hoe and **spraying** use of weedicide which is a chemical such as gramaxone, round-up and touch down. **Flooding** is also used to control weeds in rice fields

**SUCCESS CRITERIA 3:**

- **Name and describe at least two diseases affecting agricultural crops**

**ACTIVITIES**

- Teacher should prepare a list of plant diseases common to plants in Dominica and let pupils name them. The pupils are then given a plant and they should research or find out from a resource person the disease associated to the same. See table below.

## SOME PLANTS AND THE DISEASES AFFECTING THEM

PLANTS	DISEASE	SYMPTOMS
Banana	Leaf spot	Circular rings on leaf, leaf becomes brown and fruit ripe while still immature and still on tree.
Citrus	Citrus scab	Young stem becomes hard, fruits becomes rough and hard
Tomato and cucumber	Early blight	A white powdery cover is seen on the leaves
Tomato	Late blight	A purplish powdery cover appears on the underside of the leaves , fruits rot
Tania	Burning leaf	Leaves turn brown and die. Plants develop poorly.
Coconut	Crown rot	Tree top dries then fall off, leaving tree topless.
Cabbage	Damping off and head rot	Seeds may decay, Stems of young seedlings become light brown and water-soaked near the soil line. Affected seedlings quickly wilt and cabbage head becomes rot with a black colour

- Invite an agriculture extension officer to visit the school and talk to the pupils on diseases that affect plants and their symptoms. Let them write a report to include at least two diseases and the symptoms caused, at the end of the presentation.

### SUCCESS CRITERIA 4:

- **Describe ways of controlling these diseases**

### ACTIVITIES

- Invite a crop specialist/an agricultural extension officer to the classroom to talk to the students on the importance of disease control in crops. Let him identify some of the common diseases in Dominica and state the means of control for these diseases.
- **Content:** many diseases affect plants in Dominica. These diseases cause lots of losses in crop yields because of the damage to the plants and fruits. Below is a list of some plant diseases and the means of control.

<b>NAME OF DISEASE</b>	<b>SIGN</b>	<b>CONTROL MEASURES</b>
Leaf mould	White –grey ‘felt’ or cover on leaves	Use fungicide spray, captan and maneb
Powdery Mildew	White patches on leaves and fruits	Fungicide spray, peronox and captan
Virus leaf curl	Leaves contorted	Up root and burn plant
Virus mosaic	Leaves mottled and yield reduced	Uproot and burn plants
Black spot	Attack tubers by causing rot	Treat planting material with captan.
Dry rot	Tubers get hard and dry	Use healthy materials for planting
Fruit rot	Soft rot on fruit, especially during rainy season when fruit is on damp soil,	Lifting fruit and placing it onto dry grass or slated plastic mat
Southern blight	Leaves becomes yellow, white fungal growth at base of plant	Remove and burn all infected plants
Downy mildew	Fungal growth on cabbage leaves	Reduce moisture in soil, spray with copper based fungicide example Kocide
Black rot and black leg	Seed borne, yellowing, of leaves, blackening of leaf veins	Spray with fungicide Dithane

- Let pupils select 2 diseases from the above list and find out the plants affected by these diseases. Use ‘Junior Secondary Agriculture for the Caribbean for more information, ISBN # 0-333-53535-9

## **UNIT 12: ASSESSMENT**

1. Describe two methods of controlling pests in plants.
2. Name a disease that affects the banana plant.
3. Describe two methods of controlling weeds.

### **Underline the correct word or words**

4. (Early blight, crown rot) is a disease affecting the tomato plant.
5. (Scab, slab) is a disease affecting grapefruits and other citrus in Dominica.
6. (Rats, bees) are pests affecting cocoa in Dominica.



7. (Fruitfly, housefly) is a pest affecting mango and guava in Dominica
8. (Earworm, earthworm) is a pest affecting corn in Dominica
9. (blight, bright) is a disease affecting cucumber in Dominica
10. (Root borer, shoot borer) is a pest affecting banana in Dominica
11. (Coconut mite, coconut lice) is a pest affecting coconuts in Dominica