# SCIENCE DEPARTMENT

## SCOPE AND SEQUENCE

## 2012 -2013

# INTRODUCTION

The Grades 7 and 8 scope and sequence are adapted from the Reform of Secondary Education (R.O.S.E.) National Curriculum Guide.

It is geared specifically to meet the needs of our students while preparing them for the CSEC syllabus which begins in Grade 9.

Scientific skills and attitude are developed and emphasized as these are applicable to everyday situations, and will also help the students in all other subject area.

# INTEGRATED SCIENCE

# GRADE 7

| THEME 1:-EXPLORING THE ENVIRONMENT | | |
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| **UNIT 1**<br>**INTRODUCTION TO SCIENCE** | | |
| **SUB-UNITS/TOPICS** | **OBJECTIVES**<br>**Students should be able to:** | **NUMBER OF TEACHING SESSIONS** |
| **1.1** Science in Everyday Life | 1. Identify how science is involved in given situations at home, school, and community. | 1 |
| | 2. Give examples of how science and technology are related in everyday life. | 1 |
| | 3. Explain their understanding of science, technology, how science and technology are related. | 1 |
| | 4. Make inferences about the nature of science. | 1 |
| **1.2** Working Like a Scientist | 1. Introduction to drawing skills and Laboratory Equipment | 2 |
| | 2. Describe the work of a named Jamaican scientist. | 1 |
| | 3. Identify the stages in the scientific investigation | 1 |
| | 4. Carry out a given activity in a safe, clean, tidy and systematic way | 2 |
| | 5. Write a report of a lab investigation | 2 |
| **1.3** Safety Precautions In Exploring the Environment | 1. Identify specific situations in the home and classroom which may be potentially dangerous. | ½ |
| | 2. Describe ways in which potentially dangerous situations may be corrected. | 1 |
| | 3. Formulate at least five safety rules for working conditions at home, community and school. | 1 |

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| | 4. Suggest consequences that may result from not following such rules. | ½ |
| **1.4** Using Our Senses To Explore The Environment | 1. Name and locate the sense organs in humans and other animals. | ½ |
| | 2. Describe ways in which the sense organs help the animal to be aware of its environment | 1 |
| | 3. Perform investigations on the sense organs in which at least one sense organ is suppressed. | 1 |
| **1.5** Using Instruments and Equipment to Extend The Use Of The Senses | 1. List quantities that are measured and their associated units | 1 |
| | 2. Name some instruments that are used to extend the range of the senses, for measuring, magnifying amplifying, and detecting object. | 1/2 |
| | 3. Conduct experiments to explore the limitations of the senses. | 1/2 |
| | 4. Use scientific instruments to measure length, volume, mass and time. | 7 |
| | 5. Use magnify/ amplifying and detecting instrument. | 1 |
| ***NOTES:*** | | |

| THEME 2:-INVESTIGATING MATTER | | |
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| **UNIT 2**<br>**GROUPING THINGS** | | |
| **SUB-UNITS/TOPICS** | **OBJECTIVES**<br>**Students should be able to:** | **NUMBER OF TEACHING SESSIONS** |
| **2.1** Why Things Are Grouped | 1. Give reasons why it is useful to group things. | 1 |
| | 2. Observe objects and classify them in a number of different ways giving reasons for each grouping. | |
| | 3. Record the criterion used for a given grouping. | |
| **2.2** Grouping things into Living and Non-Living | 1. Observe living things and list their characteristics. | 2 |
| | 2. Classify things as living or non- living and give reasons. | 1 |
| | 3. Identify ways for caring for living or non- living in the school environment. | ½ |
| | 4. List some examples of plant parts moving in response to external stimulus. | ½ |
| **2.3** Grouping Living Things into Plants and Animals | 1. Classify a group of living things as plant and animals, and give reasons | 1 |
| | 2. Observe plants and animals and describe the main differences between them. | 1 |
| **2.4** Grouping Plants | 1. Classify plants into those that produce flowers and those that do not. | ½ |
| | 2. Identify and list a variety of plants that bear flowers and fruits. | |
| | 3. Classify flowering plants into monocotyledons and dicotyledons. | 1 |

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| **2.5** Grouping Animals | 1. Classifying animals into vertebrates and invertebrates. | 1/2 |
| | 2. Identify and describe the five sub-groups of vertebrates. | 1 ½ |
| | 3. Identify and describe all the sub-groups of invertebrates. | 2 |
| **2.6** Grouping Non-Living into Solids, Liquids and Gases | 1. Describe the characteristics of solids, liquids and gases in terms of particle spacing, shape and volume and give examples. | 2 |
| | 2. Classify living and non-living things (at room temperature) as solids, liquids and gases. | ½ |
| | 3. Carry out demonstrations of changes of state. | 1 |
| | 4. Observe and identify the changes in state of various substances | 1 |
| | 5. Describe the processes involved in the water cycle | 1 |
| | 6. Draw diagram to illustrate the water cycle. | Home work |

***NOTES:***

| THEME 3:-LIVING SYSTEMS | | |
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| **UNIT 3**<br>**LIVING THINGS AND HOW THEY REPRODUCE** | | |
| **SUB-UNITS/TOPICS** | **OBJECTIVES**<br>**Students should be able to:** | **NUMBER OF TEACHING SESSIONS** |
| **3.1** Gross Structure and Function of Flowering Plants | 1. Identify the root, stem, leaf and flowers as the main parts of a flowering plant. | ½ |
| | 2. State a main function for each part of the following plant. | 1 |
| | 3. Draw and label a simple diagram of a flowering plant | ½ |
| | 4. Suggest ways in which plants are important to the environment | 1 |
| 3.2 Structure and Function of Floral parts | 1. Name the parts of a flower | ½ |
| | 2. Describe the function of each part of a flower | 1 |
| | 3. Draw and label a diagram of a flower | ½ |
| **3.3** Sexual Reproduction in Flowering Plants | 1. Name the reproductive organs of a flowering plant and the function of each part | 1½ |
| | 2. State that pollen contains the male cell of the flower and ovule has female cells. | ½ |
| | 3. Describe the processes of pollination | 1 |
| | 4. Explain fertilization | 1 |
| | 5. State what is a seed and how fruits develop from ovary | ½ |
| | 6. Explain why some fruits have one seed while others have many seeds | ½ |
| | 7. Draw and label longitudinal section of a flower | 2 |

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| **3.4** Reproduction Without Seeds | 1. Identify and list some plants that can reproduce without making seeds. | ½ |
| | 2. Describe some ways in which new plants can be grown without seeds. | 2 |
| | 3. Perform a simple activity to illustrate reproduction without seeds. | Home work |
| **3.5** Seed Structure and Germination | 1. Identify the main parts of a seed. | 1 |
| | 2. Draw labelled diagrams to illustrate the internal and external feature. | 2 |
| | 3. Classify seeds as monocotyledons and dicotyledons. | ½ |
| | 4. Perform experiments to determine the conditions for a seed to germinate and grow into a seedling. | 2 |
| | 5. Plan and design experiments to determine the conditions for a seed to germinate and grow into a seedling. | Home work |
| | 6. Discuss the conditions for a seed to germinate and grow into a seedling. | 1 ½ |
| **3.6** Sexual Maturity and Reproduction in Humans | 1. Recognise that humans show changes in proportion as they grow. | ½ |
| | 2. Differentiate between changes in male and female during early adolescence. | 2 |
| | 3. Identify the main parts of the male and female reproductive systems. | 1 |
| | 4. State the functions of the main parts of the male and female reproductive systems. | 2 |
| | 5. Explain the process of sexual reproduction in humans. | 1 |
| | 6. Define puberty and adolescence. | ½ |
| | 7. List and explain the main changes that occur during the menstrual cycle and the importance of personal hygiene. | 2 |

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| | 8. Draw bar charts to represent data collected on height measurements. | Home work |

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| THEME 4:-HEALTHY LIVING | | |
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| **UNIT 4**<br>**RESPONSIBLE LIVING** | | |
| **SUB-UNITS/TOPICS** | **OBJECTIVES**<br>**Students should be able to:** | **NUMBER OF TEACHING SESSIONS** |
| **4.1** Sexually Transmitted Diseases | 1. Name some sexual transmitted diseases and their main symptoms. | 2 |
| | 2. Discuss the importance of responsible sexual behaviour. | 2 |
| **4.2** Drug – Use and Abuse | 1. Distinguish between useful drug and harmful drugs. | 1 |
| | 2. State that some useful drugs can have a harmful effect it used in excess. | 2 |
| | 3. Cite examples of bad drugs habits. | 1 |
| | 4. Discuss the effects of drugs abuse on the human body and on the society. | 2 |
| ***NOTES:*** | | |

| THEME 5:-ENERGY AND LIFE | | |
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| **UNIT 5<br>ENERGY** | | |
| **SUB-UNITS/TOPICS** | **OBJECTIVES<br>Students should be able to:** | **NUMBER OF TEACHING SESSIONS** |
| **5.1** Forms Of Energy and Energy Conversion | 1. State what is meant by energy. | 1 |
| | 2. State the forms of energy give an example and say how it is used. | 2 |
| | 3. Observe and identify the energy conversions occurring in some simple devices and common activities. | 2 |
| | 4. State that all energy conversion results in some of the energy being lost or wasted. | 2 |
| | 5. Describe complex systems in which energy conversion occur. | 2 |
| | 6. Distinguish different types of energy sources and classify these as renewable and non- renewable. | 1 |
| **5.2** The Sun as the Source of Energy | 1. List and discuss some other uses of the sun's energy. | 1 |
| | 2. Discuss some harmful effects of the sun's energy. | 1 |
| **5.3** Fuel and their Uses in Home, Community, Industry and Nation | 1. Define fuel | 1 |
| | 2. Classify various substances as fuels. | 1 |
| | 3. Describe how petroleum was formed and how it is used. | 2 |
| **5.4** Energy Conservation in the Home and Community | 1. Identify several ways in which energy use can be reduced in the home and community. | 1 |

| THEME 6:-THE UNIVERSE AND THE EARTH'S RESOURCES | | |
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| **UNIT 6**<br>**OUR PLACE IN THE UNIVERSE** | | |
| **SUB-UNITS/TOPICS** | **OBJECTIVES**<br>**Students should be able to:** | **NUMBER OF TEACHING SESSIONS** |
| **6.1** Our Place in the Universe | 1. State that the universe contains millions of galaxies and that each of these contains millions of stars. | 1 |
| | 2. State that some of these stars have associated planets that orbit them | 1 |
| | 3. Distinguish amongst stars, planets and natural satellites | 2 |
| | 4. Infer the relationship between the sun and the planets in this solar system. | 2 |
| **6.2** Earth and the Solar System | 1. List the planets that make up our solar system | 1 |
| | 2. List and compare the major characteristics of the planets | 1 |
| | 3. State that some stars have associated planets that orbit them. | 1 |
| | 4. Relate the special characteristics of planet earth to its suitability for allowing living things to exist. | 2 |
| | 5. Make models of the solar system | Home work |

# INTEGRATED SCIENCE

# GRADE 8

| THEME 1:-EXPLORING THE ENVIRONMENT | | |
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| **UNIT 7<br>WATER AND LIVING THINGS** | | |
| **SUB-UNITS/TOPICS** | **OBJECTIVES<br>Students should be able to:** | **NUMBER OF TEACHING SESSIONS** |
| 7.1 Water as a Major Component of Plants and Animals | 1. Define the terms solute, solvent, solution, soluble, partially soluble and insoluble. | 1 |
| | 2. Explain some physical properties of water. | 1 |
| | 3. Demonstrate the presence of water | 2 ½ |
| | 4. Infer the presence of water in tissue | 2 ½ |
| | 5. State the percentage of water in a living cell | ½ |
| 7.2 Water as a Habitat | 1. List examples of plants and animals which live in water. | ½ |
| | 2. Investigate the freezing properties of water | 1 |
| | 3. Discuss how the freezing properties of water make it suitable for life | ½ |
| | 4. Discuss how solvent property of water is both an advantage and a disadvantage. | 1 ½ |
| | 5. State the percentage of water in a living cell. | 1 |
| 7.3 Living Things Need Water | 1. Discuss how the physical properties of water are important to living organisms. | 1 |
| | 2. Perform activities to show how the presence of solutes in water affects its melting and boiling points | 2 |

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| | 3. State the composition of blood and other fluids in animals and plants | ½ |
| | 4. Infer that blood and fluids in a plant will remain liquid over a wide range of ambient temperatures | ½ |
| | 5. Explain the importance of water to transport in living things | 1 |
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| THEME 1:-EXPLORING THE ENVIRONMENT | | |
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| **UNIT 7<br>WATER AND LIVING THINGS** | | |
| **SUB-UNITS/TOPICS** | **OBJECTIVES<br>Students should be able to:** | **NUMBER OF TEACHING SESSIONS** |
| 12.1 Sources of Water | 1. Explain the term 'ground water'. | ½ |
| | 2. List a number of above ground sources of water. | ½ |
| | 3. List a number of underground sources of water. | ½ |
| | 4. Explain how water is formed. | ½ |
| 12.2 Uses of Water and Air | 1. List industries that use water as a solvent in making products | ½ |
| | 2. Apply fact that water is a solvent to explain the use of water as a cleaning agent. | 2 ½ |
| | 3. Explain the importance of water in the rearing of animals | 1 |
| | 4. Explain how water may be used for irrigation purposes and growing of crops | 1 |
| | 5. Explain how air and water may be used as sources of energy to generate electricity. | 1 ½ |
| 12.3 Gases in the Air | 1. List hydrogen, oxygen, nitrogen, carbon dioxide and water vapour as the main gases in the air | ½ |
| | 2. Use a pie chart to show the proportions of the main gases in the air | ½ |

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| | 3. List some ways in which these gases are used. | ½ |
| | 4. Illustrate diagrammatically the carbon, nitrogen and oxygen cycles | ½ |
| 12.4 Conservation of Water | List ways in which water can be conserved in the environment | 1 |
| 12.5 Water and Air Pollution | 1. List ways in which man's activities contribute to the pollution of water and air | 1 |
| | 2. State the ways in which pollution of water and air can be minimized. | 1 ½ |

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| THEME 6:-THE UNIVERSE AND THE EARTH'S RESOURCES | | |
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| **UNIT 18<br>MORE ABOUT THE EARTH'S RESOURCES** | | |
| **SUB-UNITS/TOPICS** | **OBJECTIVES<br>Students should be able to:** | **NUMBER OF TEACHING SESSIONS** |
| 18.1 Rocks and Minerals | 1. Give an operational definition for the terms – Minerals and Rock | ½ |
| | 2. Give a simple explanation of how minerals are formed. | 1 |
| | 3. Identify rock types – Igneous, Metamorphic and Sedimentary | ½ |
| | 4. Explain how sedimentary, igneous and metamorphic rocks are formed. | 1 ½ |
| | 5. State some properties of minerals/rocks | 1 |
| | 6. Name some sources of minerals | ½ |
| | 7. State some important uses of named minerals and rocks | ½ |
| 18.2 Soil and Soil Conservation | 1. Describe ways in which soils are formed | 1 ½ |
| | 2. Describe ways in which soil is lost | 1 |
| | 3. List the ways in which soil may be conserved. | 1 |
| | 4. Explain the importance of conserving soil. | 1 |

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| 18.3 Forest Wildlife and Their Conservation | 1. State that forests and wildlife are resources of the earth. | 1 |
| | 2. Explain the interdependence of forest and wildlife | 1 ½ |
| | 3. Explain the importance of forests in maintaining the watershed. | 1 |
| | 4. Explain the importance of preserving the indigenous species of plants and animals | 1 |

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| THEME 5:-ENERGY AND LIFE | | |
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| **UNIT 11<br>ENERGY IN THE HOME** | | |
| **SUB-UNITS/TOPICS** | **OBJECTIVES<br>Students should be able to:** | **NUMBER OF TEACHING SESSIONS** |
| 11.1 Heat Transfer | 1. Explain how heat transfer takes place for conduction, convection and radiation | 1 ½ |
| | 2. Give examples of appliances which operate by using heat transfer | 1 |
| | 3. Record observations made during practical activities on heat transfer | 2 ½ |
| | 4. Make inferences about the processes of conduction after observing practical activity on conduction | 1 ½ |
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| 11.2 Investigating Static Electricity | 1. Describe how static electricity can be produced | 1 |
| | 2. Perform simple activities on the production of static electricity | 2 |
| | 3. State one way of removing static electricity | 1 |
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| 11.3 Electricity in the Home | 1. State that electricity is the main source of energy in most homes. | 1 |
| | 2. Define electric current | 1 |
| | 3. Construct simple circuits using lamps, insulated wires, | 4 ½ |

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| | dry cells, switches | |
| | 4. Classify substances as insulators and conductors of electricity | 1 |
| | 5. Distinguish between series and parallel circuits. | 2 ½ |
| | 6. Draw diagrams to represent series and parallel circuits | 2 ½ |
| | 7. Explain how series and parallel circuits work | 2 ½ |
| | 8. Give examples of series and parallel circuits in the home | 2 |
| | 9. Read a dial or digital (electricity) meter | 2 |
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| 11.4 Electricity, Electronics and Magnetism | 1. State what is meant by electronics | 1 |
| | 2. Give examples of electronic devices used in the home, school and community | 1 |
| | 3. Perform simple activities to infer the behaviour of magnets | 1 ½ |
| | 4. State ways in which magnets are used | 1 |
| | 5. Demonstrate how an electric current can induce magnetism. | 1 ½ |
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| 11.5 Safe Use of Heat and Electricity | 1. Recall that heat is produced when electrical appliances are operated | ½ |
| | 2. Formulate safety rules to follow when using appliances | ½ |
| | 3. Identify devices which ensure the safe operation of appliances e.g. fuses, circuits breakers, 3-pin plugs. | 1 |
| | 4. State consequences of not using appliances in a safe manner | ½ |
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| THEME 2:-INVESTIGATING MATTER | | |
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| **UNIT 8<br>UNITS OF MATTER** | | |
| **SUB-UNITS/TOPICS** | **OBJECTIVES<br>Students should be able to:** | **NUMBER OF TEACHING SESSIONS** |
| 8.2 The Basic Unit of Living Things – The Cell | 1. Draw a diagram of a typical plant and animal cell showing the basic parts. | 1 ½ |
| | 2. State the various parts of the cell. | 1 ½ |
| | 3. State differences between plant and animal cells. | 1 |
| | 4. Identify at least three types of animal cells and plant cells | ½ |
| | 5. List the activities of the cell | 1 ½ |
| | 6. Infer that all the activities of the organism are dependent on the functioning of its cell | 1 ½ |
| | 7. State that the main differences between living and non-living things are related to the differences in the structure and function of their basic units. | 2 |
| 8.3 Body Systems | 1. Define the terms organelles, cell, tissue, organ, system, unicellular organism, multicellular organism. | 2 |
| | 2. Identify tissues, organs and systems in the animal body and flowering plants | 1 ½ |
| | 3. Name the organs making up systems in plants and animals. | 1 ½ |
| | 4. Give examples of unicellular and multicellular organisms. | ½ |

| THEME 4:-HEALTHY LIVING | | |
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| **UNIT 10<br>KEEPING HEALTHY** | | |
| **SUB-UNITS/TOPICS** | **OBJECTIVES<br>Students should be able to:** | **NUMBER OF TEACHING SESSIONS** |
| 10.1 Food and Health | 1. List the nutrients in food | ½ |
| | 2. Discuss the functions of each nutrient in the body | 1 ½ |
| | 3. Identify the food groups | 1 |
| | 4. Classify foods into the food groups | 1 |
| | 5. Define the term 'balanced diet'. | ½ |
| | 6. Make up a menu for a balanced diet | ½ |
| | 7. Check labels to determine if the foods contribute to a balanced diet | Home work |
| | 8. Define deficiency disease | ½ |
| | 9. Give examples of deficiency diseases | 1 |
| 10.2 Food Tests | 1. Perform tests to identify nutrients in food substances | 2<br>Home work |
| | 2. Make accurate observations during food tests | |
| | 3. Make accurate observations during food tests | |
| | 4. Infer the nutrients that are present in food substances based on food tests results | |
| 10.3 Cleanliness, Exercise, Rest and | 1. Explain the importance of keeping the self, and surroundings, clean, so as to maintaining good health. | 1 |

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| Health | 2. State that regular exercise and rest contribute to good health. | 1 |
| | 3. Critically assess their own lifestyle and lifestyles of other persons. | 1 |
| 10.4 Safety and Health | 1. Describe simple measures of dealing with burns, wounds, shock, choking, poisons and fractures | 1 ½ |
| | 2. Suggest basic items that should be placed in a First-Aid Kit and give reasons for the inclusion of each item | 1 |

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