

**Herbert Morrison Technical High School
Science Department
Biology Section**

Syllabus- Grade 7



Biology Syllabus - Grade7

Term/ Month	Topic/Unit1	Major Concept	General Objectives	Specific Objectives	Teaching Strategies	Suggested Learning Activities
<p><i>Term 1</i></p> <p><i>September 2016</i></p> <p><i>Duration for Unit 1: 4weeks</i></p>	<p>Unit 1.1</p> <p>INTRODUCTION TO BIOLOGY</p>	<p>Science is a systematic and logical approach to discovering how things in the universe work. It is also the body of knowledge accumulated through the discoveries about all the things in the universe.</p> <p>Biology is the science of life. Biologists study the structure, function, growth, origin, evolution and distribution of living organisms. http://www.livescience.com</p> <p>Broad groups of Biology- <i>See appendix</i></p> <p>Some local scientist in Jamaica are: Thomas P. Lecky- Jamaican Scientist who has developed Jamaica Hope. Professional Manley West has done extensive the marijuana plant. Professor Errol Morris is world renowned for his research work on Diabetes Mellitus. Professional Louis Grant-Jamaican Microbiologist who worked on Leptospirosis</p>	<ol style="list-style-type: none"> 1. Understand the meaning of science. 2. Understand that safety precautions are necessary in exploring the environment. 3. Be aware of the usefulness of working in a scientific manner in problem solving. 4. Be aware of the various career choices in biology. 	<p>Students should:</p> <ol style="list-style-type: none"> 1. Give a definition for science (students can be shown pictures and asked to describe the science in the picture). 2. Give a definition for biology. 3. List the broad groups in biology <ul style="list-style-type: none"> • Entomology • Microbiology • Botany • Zoology • Taxonomy • Ecology • Aquatic biology • Evolution genetics and systematic 4. Define each area listed in (c) above and outline what the scientist does. 5. List careers that are specific to each group of biology. 6. Name some local and international scientist in biology and state which area of biology they worked/are working (flash cards of local scientists may be used). 7. Describe the work of one local scientist (assignment). 	<p>Discussion on the concept on what is science.</p> <p>Peer discussion and presentation on what is biology.</p> <p>Power point Presentation on the broad groups of biology.</p> <p>Peer Teaching/ Oral Presentation on careers that are specific to each group of biology.</p>	<p>Research Project on one of the following local scientist: Peer oral and assessment)</p> <p>- Dr. Harold M. Johnson - Dr. Cicely Williams. - Dr. William E. McCulloch - Dr. Leigh. D. Lord - Dr. Kenneth Richards - Dr. Paula Tennant.</p> <p>Oral Presentation on any international scientist and their work (Collaborative Activity)</p> <p><u>RESOURCES</u></p> <p><i>Integrated Science for Jamaica- Second Edition (pg. 3-4)</i> Jamaica Gleaner Article- Dreamers Among us www.old.jamaica-gleaner.com</p>

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	UNIT 1.2 SCIENCE AND THE SCIENTIST	Laboratory rules and symbols <i>see appendix</i> First aid is the assistance given to any person suffering a sudden illness or injury, with care provided to preserve life, prevent the condition from worsening and/ promote recovery. First aid methods used for eye injury, burns, electrical shock, poisoning, fainting, cuts and broken bones. <i>(Sec cxc Int. Science pg. 131-132)</i>	<ol style="list-style-type: none"> Understand that safety precautions are necessary in exploring the environment. Be aware of the usefulness of working in a scientific manner in problem solving. 	Students should: <ol style="list-style-type: none"> Recall the laboratory safety rules (include safety precaution labels). Distinguish between a safe and unsafe science class (slide show and pictures). Outline some safety rules which should be observed in biology at home. Define first aid. Outline the aims of first aid List and briefly discuss the first aid methods used in eye injury, burns (fire and acids), electric shock, poisoning, fainting, cuts, sprains, and broken bones. 	Power point on safety precautions. Class Discussion on rules that should be observed in biology in the lab and at home. Videos/ pictures to show safe and unsafe classrooms. PowerPoint/ videos on first aid methods.	Participate in simple activities to demonstrate what should do in various scenarios within the lab. E.g. Spills, using reagents, seating etc. Students should make a first aid kit with all the necessary materials that should be present in it. <u>RESOURCES</u> <i>Integrated Science for Jamaica- Second Edition</i> https://msu.edu
	Unit 1.3 THE SCIENTIFIC METHOD- Working like a scientist.	Diagram of the microscope- <i>See Biology for CXC – June Mitchelmore pg. (4-5)</i> Biological drawings <i>See Biology for CXC June Mitchelmore- pg. (3-4)</i> Scientific Method <i>See Biology for CXC June Mitchelmore- pg. (3)</i>	<ol style="list-style-type: none"> Begin using the skill thinking process associated with the practice of science. Be aware that both senses and instruments can be used to explore the environment. 	<u>Specific objectives</u> Students should: <ol style="list-style-type: none"> Name and draw basic laboratory equipment (beaker, tripod stand, wire gauze, filter funnel, filter paper, Bunsen Burner etc.) Emphasize line diagrams, no shading, no sketching, no arrow heads, draw and label in pencil. Draw a diagram of the electron microscope; identify the different parts and state their function. Explain the ways in which one can care for the microscope. Describe the scientific method (see spotlight science 7 chapter 7). Investigate a problem using the scientific method e.g. Testing discoloration of peeled green 	Show and Tell-Present laboratory equipment to students and engage them in a class discussion on each of them. Planning and Designing labs.	Drawing of the electron microscope. Students working in pairs and viewing prepared slides of fruitfly, spider, cheek cells under high or low power. Plan and designing lab- Scientific Method . Why do bananas ripe faster when they are placed in the cupboard when compared to when they are left on the cupboard. Testing the discoloration in apples when they are exposed to air.

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				<p>banana when exposed to air.</p> <p>6. Record an experiment using the block orientation.</p> <ul style="list-style-type: none">• Underline each heading and sub headings• Use the sub heading aim, materials and apparatus, diagram, method/procedure, result/observation, conclusion.• Explain what is required for each sub heading.		
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Term/ Month	Topic/Unit 2	Major Concept	General Objectives	Specific Objectives	Teaching Strategies	Suggested Learning Activities							
	UNIT 2.1 LOOKING AT LIVING THINGS	<p>There are seven characteristics of living things. Organisms that living will eventually die- this happens when all the life process of that organisms have come to a halt.</p> <p>Characteristics of Living things- <i>See pg. 6-8 Biology for CXC.- June Mitchelmore</i></p>	<p>Students should demonstrate:</p> <ol style="list-style-type: none"> 1. An understanding that all living things have a set of characteristics that are unique, which are used to distinguish them from non-living things. 	<p>Specific objectives Students should be able to:</p> <ol style="list-style-type: none"> 1. List the differences between living and non-living things and dead things. 2. Group things into living, non-living and dead sets. 3. State that living things have seven unique characteristics. 4. State that all living things are made up of cells. 5. Define the term cell. 6. Identify examples of plant and animal cells. 	<p>PowerPoint presentation on the characteristics of living things</p> <p>Videos to show the different characteristics of living things in animals and plants.</p>	<p>Construction of a table with the differences between living, non- living and dead things.</p> <p>Construct a table to show five examples of plants and animals cell. (Research Project)</p>							
	UNIT 2.2	<p>Classification is the systematic grouping of living things based on characteristics, hierarchical or phylogenetic relationships. Classification is sometimes referred to as taxonomical hierarchy.</p> <p>Binomial system is the standard system that is used in the naming of living organisms. This name is called the scientific name and is made up of two names- the genus name and the species name.</p> <table border="1"> <tr><td>Kingdom</td></tr> <tr><td>Phylum</td></tr> <tr><td>Mammalia</td></tr> <tr><td>Order</td></tr> <tr><td>Family</td></tr> <tr><td>Genus</td></tr> <tr><td>Species</td></tr> </table>	Kingdom	Phylum	Mammalia	Order	Family	Genus	Species	<ol style="list-style-type: none"> 1. An understanding that all living things are placed into five main groups which are further divided into subgroups. 	<ol style="list-style-type: none"> 1. Define the term classification. 2. Explain what the binomial system is and why is it important. 3. Classify organisms based on their observed similarities and differences using the following criteria hair, colour, and shape, number of legs, wings and antennae. 4. Construct a concept map to show how living things are grouped using the taxonomy hierarchy. 5. Classify plants as flowering or non-flower and as monocots and dicots. 6. Classify animals as vertebrates and invertebrates. 7. Identify the five groups of vertebrates and site examples of each. 8. List the characteristics of the five groups of vertebrates. 9. Identify the different groups of invertebrates <ul style="list-style-type: none"> • Worms, (flat, round and 	<p>Hand-outs on taxonomy</p> <p>PowerPoint Presentation of how living things are group.</p>	<p>Lab activity on collecting and examining and classifying living things in the environment. (<i>See page 13 Biology for CXC</i>)</p> <p>Assignment: Students should find out the proper names (scientific name of five organisms that is present in the environment.</p> <p>Worksheet on classifying plants and animals using the following taxonomical hierarchy- Kingdom, phylum,</p>
Kingdom													
Phylum													
Mammalia													
Order													
Family													
Genus													
Species													

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		<p><i>See Integrated Science for Jamaica second Edition pg. 49-58</i></p> <p><i>CXC Biology- Linda Atwaroo-Ali pg. 5- 10</i></p> <p><i>Biology for CXC page 14-19</i></p>		<p>ringed)</p> <ul style="list-style-type: none"> • Molluscs (snail, mussel, octopus, slug, squid) • Arthropods <ul style="list-style-type: none"> - <i>Crustaceans</i> eg. Shrimp, woodlouse, water flea, ghost crab } - <i>Myriapods</i> e.g. Centipede, millipede - <i>Arachnids</i> e.g. Spider, scorpion, tick, mite - <i>Insects</i> e.g. Butterfly, Grasshopper <p>10. Classify animals and plants using the following taxonomical criteria- kingdom, phylum, and class.</p>	class.
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- Writing in red denotes a concept that is on the National Standards Curriculum that was not included in our syllabus.

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Term/ Month	Topic/Unit 3	Major Concept	General Objectives	Specific Objectives	Teaching Strategies	Suggested Learning Activities
	UNIT 3.1 LIVING THINGS AND HOW THEY REPRODUCE	<p>All flowering plants have the same basic structure. They consist of four main parts: stem, leaves, roots and flowers.</p> <p>They are important as they provide food, shelter/ shade to other organisms.</p> <p>Plants are important to the hydrologic cycle as water vapour is released into the atmosphere via transpiration.</p> <p>Plants are beneficial to man in many ways. Plants are used as medicine, food, in ecotourism, the making of houses etc.</p> <p>Plants keep the oxygen and carbon dioxide level balanced in the atmosphere. Excess Carbon Dioxide can lead to dangerous changes in global warming.</p>	<p>Students should be able to:</p> <ol style="list-style-type: none"> 1. Appreciate that all flowering plants have similar basic features. 2. Be aware of the need to care for flowers. 	<p>Students should be able to:</p> <ol style="list-style-type: none"> 1. Identify the root, stem, leaf and flower as the main parts of a flowering plant. 2. State the main function of each part of the flowering plant. 3. Define the concept photosynthesis. 4. State why plants are important to the environment. (medicinal purposes, food, shelter, carbon sinks) 5. State the role that they play in the water cycle. (transpiration) 6. State how plants are beneficial to man. 7. Draw and label a simple diagram showing the main parts of a flowering plant. 8. Use hand lens correctly. 	<p>Using plants in class to show the main parts of a flowering plant.</p> <p>Video on the different functions of the different parts of the plant</p>	<p>Lab: Draw and label the structure of a flowering plant. Using hand lens to observe the different parts.</p> <p>Lab: Transport in a stem using food colouring and balsam. (<i>see Integrated Science for Jamaica Second Edition pg. 70</i>)</p> <p>Presentation on how plants are beneficial to man. Suggested areas of focus can include</p> <ul style="list-style-type: none"> - Food - Clothing - Medicine (plants that are used as medicines) - Housing (furniture making) - Tourism- Eco Tourism - Paper Industry <p>N.B. Let students research the concept of phytoremediation for their own development.</p>

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Term/ Month	Topic/Unit 3	Major Concept	General Objectives	Specific Objectives	Teaching Strategies	Suggested Learning Activities
	UNIT 3.2 LIVING THINGS AND HOW THEY REPRODUCE - Structure and function of floral plants	<p>The flower is the part of the plant that contains the male and female reproductive structures.</p> <p>Parts of the flower- <i>See page (210-212) CXC Biology</i></p> <p><i>Biology for CXC- see page 287</i></p> <p>Sexual Reproduction in Plants:</p> <p>Pollination and Fertilization- <i>see Biology for CXC page 289-290</i></p> <p>Flowers play an important function in the formation of fruits and seeds. Seeds play a vital role in producing the next generation of plants when they germinate. <i>See page 74- 75 Integrated Science for Jamaica.</i></p>	<p><u>Students should be able to:</u></p> <ol style="list-style-type: none"> Understand the importance of flowers to flowering plants. Be aware of the need to care for flowers. Appreciate the importance of discontinuing the indiscriminate destruction of young fruits. 	<p>Students should be able to:</p> <ol style="list-style-type: none"> State that there are two types of reproduction. State that flowering plants reproduce via sexual reproduction. Name the reproductive organs of flowering plants. State that pollen contains the male cells of the flower. State that the ovule contains the female cells of the flower. Define Pollination. Name the types of Pollination. List some agents of Pollination Draw a diagram to illustrate how pollen grains travel down the pollen tube to the ovule. State that the ovule develop into a seed and the ovary develop into a fruit. Identify some plants that reproduce by producing suckers, root tubers, bulbs, tubers. Explain why are these plants referred to as seedless plants 	<p>PowerPoint and hand outs with the parts of the flower and their function</p> <p>Lab to examine the internal and external part of a flower.</p> <p>Experiments to investigate the structure of pollen- (Shake pollen from a hibiscus plant and then placed it on paper, and let students observe with hand lens)</p>	<p>Lab: Examining the internal and external structure of a flowering plant.</p> <p>See page 291 Biology for CXC</p> <p>Collaborative research project on seedless plants that reproduce by asexual reproduction:</p> <ul style="list-style-type: none"> Rhizomes Suckers Root tubers Bulbs

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	UNIT 3.3 LIVING THINGS AND HOW THEY REPRODUCE – Seed and Germination	<p>Germination is the process by which a seed grows in to a seedling.</p> <p>Structure of a seed and germination See: CXC Biology page 217</p> <p>Seed dispersal CXC Biology page 215</p>	<p><u>Students should be able to:</u></p> <ol style="list-style-type: none"> Understand the importance of flowers to flowering plants. Be aware of the need to care for flowers. Appreciate the importance of discontinuing the indiscriminate destruction of young fruits. 	<p><u>Students should be able to:</u></p> <ol style="list-style-type: none"> Define the term seed. Draw the structure of a seed. Identify the parts of a seed and state their function. Explain what seed dispersal is. State the ways in which seeds are dispersed into the environment. Explain why it is important for seeds to move away from the parent plant. Define germination Identify the conditions that are necessary for germination Perform activities to demonstrate the process of germination in seeds. 	<p>PowerPoint and hand outs with the parts a seed.</p> <p>Lab to examine the internal and external part of a seed.</p> <p>Presenting various seeds and then let students infer what mode of dispersal by the plant in dispersal (pictures or seeds can be used.</p> <p>Class Discussions</p>	<p>Drawing and labelling of the structure of a seed.</p> <p>Lab: Germination in red peas.</p>

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Term/ Month	Topic/Unit 4	Major Concept	General Objectives	Specific Objectives	Teaching Strategies	Suggested Learning Activities
	UNIT 4.1 LIVING THINGS AND HOW THEY REPRODUCE – Sexual maturity and reproduction in humans	Puberty is the period in which boys and girls become sexually mature. Integrated Science for Jamaica Second Edition- pg. (85- 89) CXC Biology page 189	<u>Students should be able to:</u> 1. Appreciate the changes boys and girls undergo during puberty. 2. Relate the structure of the reproductive systems to their function.	Students should be able to: 1. Define the term puberty. 2. List the changes that boys and girls undergo during puberty. 3. Draw and label the structures of the male and female reproductive system. 4. State the function of the organs that make up the male and female reproductive organs.	Class discussion on some of the changes that boys and girls undergo during puberty. PowerPoint on the functions of the organs that make up the male and female reproductive structures.	Constructing a table to show the changes that boys and girls undergo during puberty. Drawing of the male and female reproductive structures.

Fig. 1

Broad Fields of Biology

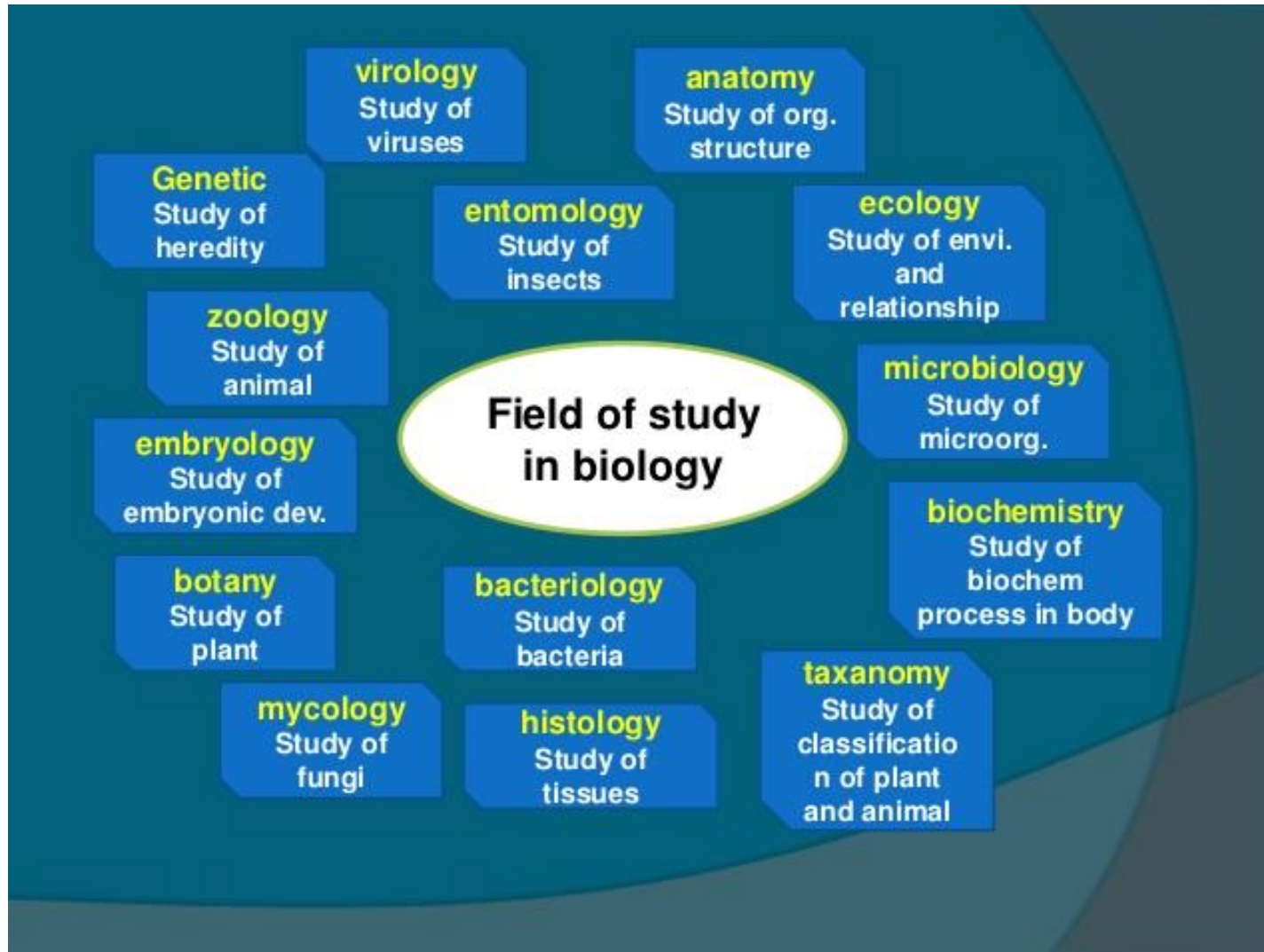


Fig 3. How Living Things are Classified

