Integrated Science year plan

Form 1

August 2020 – June 2021

Term I				
Week	Topic	Objectives	Activities and	Assessments
1	Unit 1 Introduction to Science What is Science? Science process skills Products of Science	1. Know the meaning of Science. 2. Outline the attitudes that a scientist should have in addition to the skills.	Find meanings of all the words in bold in chapter 1	
2	The Scientific method Safety rules in the laboratory	1. Discuss the Scientific method. 2. List the safety rules to be observed in the Science laboratory.	Lab: Testing a hypothesis. Lab: Yeast is more active in warm water than in cold water. *(TBD based on COVID status)* **YouTube video; The Scientific method** (https://www.youtube.com/watch?v=yi0hwFDQTSQ)	Quiz
3	Laboratory apparatus Benefits, abuses and limitations of Science and technology	Explain the limitations of science and technology in solving societal problems.		Test September 7rd – 12th 2020
4	**Unit 10 BIOLOGY** Classification of living things Introduction to classification of living things	Define living organisms. Discuss how to classify living organisms according to commonly observable characteristics.	Lab: Classifying plants and animals *(TBD based on COVID status)* **Online zoom interactive activity:** plant samples and	

			classification	
5	Classification of plants	Describe the major groups of plants.	Lab: Constructing a dichotomous key to classify leaves	Quiz
6	Classification of animals Using keys to classify animals	Describe the major groups of animals. Construct a dichotomous key. Use simplified keys in identifying and classifying organisms.		Group presents on major plant groups and animals.
7	**Unit 11** Cells The basic unit of living things Animal and plant cells	Recognize that most cells cannot be seen with the naked eyes To recognize that cells contain non-living materials, e.g. proteins and salt State the difference between a unicellular organism and a multicellular organism and give an example of each.	**Lab: Teacher demonstrate on zoom platform** – Plant and animal cell demonstration using a boiled egg Lab write up in copy books	Test October 13-16th 2020
8	Different cells for different functions Substances can alter the way cells function	Describe the structures of a typical animal cell and plant cell and differentiate them with the help of a light microscope. Explain the functions of organelles Explain the numerous chemical reactions that take place in the cell.	Activity: Construct 3-D models of plant cells and animal cells using readily available material. Example; differently shaped pasta can be used to represent the various structures in the cell. (*Based on COVID status)*	
9	Diffusion/Osmosis in cells Cell research	Describe the movement of gases and water into and out of cells during diffusion and osmosis. Explain how the basic cell structure is modified to accommodate different functions. Show an awareness of recent developments in cell research.	Activity: Carry out a class debate on human cloning. The motion is "Human cloning should be allowed" Online- draft script of debate	Test November 9th- November 13,2020

		Review for exam/Exam		

Term II				
Week	Topic	Objectives	Activities	Assessments
1	Unit 12 Micro-Organisms What are Micro-organisms? How do Micro-organisms obtain nutrients?	▪ Give examples of micro-organisms. ▪ Recognize that micro-organisms can live in or on a host organism. ▪ Recognize the ways in which unicellular organisms meet their basic needs.	▪ Lab *(TBD)*	Group activity
2	Bacteria, fungi and viruses Diseases caused by Micro-organisms and viruses	▪ Distinguish between viruses, bacteria and fungi. ▪ To distinguish between the ways in which each type of micro-organism interacts with its host. ▪ Investigate the conditions which encourage the growth of mold on food.	Activity: Cheese making involves the use of micro-organisms. Find out how cheese is made and what gives different cheeses different flavours and tastes. .	Quiz
3	Micro-organisms and decomposition Biotechnology	▪ Describe the role of micro-organisms in decomposition. ▪ Investigate the activity of yeast in bread-making. ▪ Investigate the activity of bacteria in the making of yoghurt. ▪ Investigate the nature and use of antibiotics. ▪ Discuss single-cell protein production.	Activities: Design a tie or scarf with microbe motif. Write a poem or calypso about micro-organisms. Your work should include the characteristics, benefits and harms of micro-organisms.	Test December 7th-December 11th ,2020

5	Unit 3 **CHEMISTRY** Matter What is matter? Physical properties of matter	▪ Define matter ▪ Explain the meaning of physical properties of matter such as strength, hardness, melting point, boiling point, electrical conductivity and heat conductivity.	Lab; Testing the electrical conductivity of different materials. *(Based on COVID status)*	
6	Materials-Their sources and products Materials- Their properties and uses.	▪ Give examples of products manufactured from some common materials. ▪ Identify the sources of some common materials found in a product. (e.g. Plastic from petroleum and glass from sand)	Activity: Construct a case study to show how the use of materials affect the local environment.	Quiz
7	Impact of the use of materials on the Environment	▪ Identify the properties that make different materials useful in everyday products. ▪ Show awareness of the impact of the use of materials on the environment.		Test January 4th - January 8th 2020
8	Unit 4 Elements and Compounds What is an Element? Chemical Symbols	▪ Define an element. ▪ Name and identify some common elements. ▪ State the general characteristics of metallic and non-metallic elements. ▪ Describe some uses of applications of common elements	Lab: Investigating some general properties of metallic and non-metallic elements Online; Lab observation	
9	Classifying Elements Uses of Elements	• Recognize the common symbols of common elements. • Recognize how the elements are classified in the periodic table.	Activity: For a long time, water was thought to be an element until technology enabled us to break water down into hydrogen and oxygen. Construct a PowerPoint presentation suggesting why water was thought to be an element for so long.	Group work

10	What is a compound? Formation of compounds	▪ Define a compound. ▪ Give examples of compounds. ▪ Describe some common properties of compounds. ▪ Describe how compounds are formed		Test February 1st – February 5th 2020

Term III				
Week	Topic	Objectives	Activities	Assessments
1	Unit 5 Mixtures What is a mixture? Heterogeneous Mixtures	▪ Define a mixture ▪ Recognize that elements and compounds are pure substances but mixtures are not. ▪ Describe some common properties of mixtures.	Lab : To differentiate among solutions, colloids and suspensions (*TBD based on COVID status)*	
2	Homogeneous Mixtures Colloids	▪ Investigate the differences between mixtures and compounds. ▪ Give examples of heterogeneous mixtures. ▪ Give examples of homogeneous mixtures. ▪ Describe the nature of solutions. ▪ Describe the nature of colloids.	Activity: Patients whose kidneys have failed, have to go through dialysis, which is a method used to separate colloids. Find out more about the dialysis process that kidney patients have to go through. With the help of a simplified diagram, make a poster to explain the procedure in simple terms to your classmates. Co-operative learning)	Group presentation
3	Differentiating Solutions, Colloids and Suspensions	▪ Explain that many of the reactions occurring in living systems are best interpreted in terms		Test: March 1st – March 5th 2020

		of reactions involving colloids. ▪ Investigate and give examples of the uses and applications of mixtures in everyday life. ▪ Distinguish between solutions, colloids and suspensions.		
1	Unit 6 Separating Mixtures Separation techniques Magnetic Attraction	▪ Describe the basic principles involved in some techniques used to separate mixtures, such as filtration, distillation and chromatography.	Lab: Separating iron filings, sand and salt (*TBD based on COVID status)*	Lab
2	Filtration Evaporation	▪ Explain how the differences in properties of components in a mixture are used in each of the following separation techniques; magnetic attraction, filtration, distillation, chromatography.	Group Co-operative project: Both water treatment and sewage treatment plants make use of a variety of separation techniques to treat water. In groups of four or five, choose to research either on a water treatment plant or sewage treatment plant to find out the separation techniques involved at the various stages of treating water or sewage.	Group work
3	Distillation Reverse Osmosis Chromatography	▪ Describe the applications of the various separation techniques in everyday life and industries. ▪ Describe the techniques involved in obtaining pure water from seawater in desalination plants.		Test: March 29th – April 2nd 2020
1	PHYSICS Unit 13 Energy	▪ Define Energy as the ability to do work ▪ Recognize that energy can exist in many different forms. ▪ Understand that energy can be converted	Lab : What affects the gravitational potential energy of objects?	Lab

	What is Energy?	from one form to another	*(TBD based on COVID status)*	
2	Forms of Energy Conversion of Energy	▪ Describe some energy conversions ▪ Understand that energy cannot be destroyed ▪ Understand that work is done when energy changes from one form to another ▪ Recognize that the sun is our principal source of energy.	Activity: Which renewable energy source – the Sun, tides, wind, hydroelectric energy or geothermal energy – is a suitable source of energy for Trinidad and Tobago? Explain your choice and discuss the limitations of harnessing this source of energy in Trinidad and Tobago.	Quiz
3	Sources of Energy Alternative Energy sources and Conserving Energy	▪ Recognize that light energy from the sun is used by plants during photosynthesis to produce food. ▪ Recognize that food is a source of energy that derives its energy from the sun. ▪ Describe the different sources of energy. ▪ Explain why non- renewable sources of energy like fossil fuels have to be conserved and the need to develop alternative sources of energy for wide-scale use.	Group work -Imagine you are the boss of a factory manufacturing canned food. What measures would you take in your factory to conserve energy? How do you think conserving energy would help your business to be more competitive?	Test: May 10th – May 14th 2020
		Review for exam / Exam		