

Grade 9

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



Grade 9 Biology Syllabus

Term/ Month	Topic/Unit1	Major Concept	General Objectives	Specific Objectives	Teaching Strategies	Suggested Learning Activities
<p>Term 1</p> <p>September</p>	<p>Basic unit of living things</p>	<p>Parts of the microscope</p> <p>How to use the microscope</p> <p>Introduction to cells.</p> <p>Drawings and function of major parts of plant and Animal cell</p>	<p>Define the term cell.</p> <p>Draw and label plant and Animal cells</p> <p>State function of major parts of plant and Animal cell</p> <p>Compare plant and animal cells</p>	<ol style="list-style-type: none"> 1. State the seven characteristics of living things. 2. State that the cell is the fundamental building block of all living things 3. Identify the name of the scientist who discovered the cell. 4. Give explanation on how the history of how the cell was discovered. 5. Draw a diagram of the electron microscope and explain the function of each of each part. 6. Identify the different parts of the cell and 	<p>Power point presentation</p> <p>Discussion</p>	<p>Make labeled drawings of animals and plant cells.</p> <p>Perform activities to observe plants and animal cell under a microscope.</p> <p>Construct tables to show the differences between plant and animal cells.</p> <p>Draw and label a diagram of the electron microscope.</p> <p>Construct a table with the parts and function of the electron microscope. https://www.bbc.co.uk/bitsize/topics/znyycdm/articles/zfj3rwx</p>

Grade 9 Biology Syllabus

				<p>state their function</p> <p>7. State the difference between plants and animal cells</p> <p>8. Distinguish between multicellular, non cellular and unicellar and give examples of organisms that have each of the cellular structure outlined above</p>		
--	--	--	--	---	--	--

Grade 9 Biology Syllabus

Term/ Month	Topic/Unit1	Major Concept	General Objectives	Specific Objectives	Teaching Strategies	Suggested Learning Activities
<p>Term 1</p> <p>October</p>	<p>Specialization of Cells</p>	<p>1. Definition of term</p> <p>2. Importance of cell specialization</p> <ul style="list-style-type: none"> • Relate structure to function of some specialized cells- Drawings to included (<i>E.g. nerve cell, palisade cell, red blood cell, guard cells, root hair cells, epithelial cells, sperm cell, egg cell smooth muscle cell</i>) • Over-view of Tissues- blood, epithelial. • Over-view of Organs- heart, skin, and leaf. • Over-view of systems- e.g. nervous, Circulatory, reproductive systems • Classify Organisms according to complexity- Non-cellular, unicellular and multi-cellular. 	<p>Define the terms:</p> <ol style="list-style-type: none"> a) cell specialization b) tissue c) organ d) Organ e) Systems <p>Relate structure to function of some specialized cells.</p> <p>Drawing of common specialized cells.</p> <p>Classify Organisms using the terms multicellular, unicellular and non cellular.</p> <p>Draw a unicellular organism</p>	<ol style="list-style-type: none"> 1. Classify organism according to their complexity using the following non cellular, unicellular and multicellular. 2. State why it is important for multicellular organisms to consists of specialized cells. 3. Identify the names of specialized cells that are present in plants and animals (nerve cell, palisade cell, red blood cell, guard cell, root hair cell, sperm cell, egg cell) 4. State the functions of these specialized cells that are identified in 2 above. 	<p>Power point presentation</p> <p>Discussion</p>	<p>Make labeled drawings of specialized animals and plant cells.</p> <p>Make labeled drawings (models) of specialized plants and animals cells in 3 above.</p> <p>Watch videos to learn about the structure of blood (tissue), heart and the leaf.</p> <p>https://www.bbc.co.uk/bit/size/topics/znyycdm/articles/zfj3rwx</p>

Grade 9 Biology Syllabus

		<p><i>Give examples in each case</i></p> <p><i>Introduction to cells.</i></p> <p>Drawings and function of major parts of plant and Animal cell</p>		<p>5. State the connection that exists between cells, tissues, organs and systems.</p> <p>6. Identify two examples of tissues, organs and systems in the body</p>		
--	--	--	--	---	--	--

Grade 9 Biology Syllabus

Term/ Month	Topic/Unit1	Major Concept	General Objectives	Teaching Strategies	Specific Objectives	Suggested Learning Activities
Term 1 November	Transportation in animal	Structure and function of the human circulatory system	<ul style="list-style-type: none"> • State the importance of a complex circulatory system to man • Describe structure and function of the heart. • Relate the structure to the function of each type of blood vessel <p><i>Capillaries, Veins and Arteries</i></p> <ul style="list-style-type: none"> • Describe the components of blood • State the role of each blood component 	<p>Power point presentation</p> <p>Discussion</p>	<ol style="list-style-type: none"> 1 Give reasons why a small organism like an amoeba does not need special structures for transport. 2 Explain the need for transport systems in multicellular organisms. 3 Identify the types of materials which need to be transported in animals. 4 Identify the components of blood. 5 Identify the components of the circulatory system in man. 6 Identify the different structures of the heart 7. State how the different structure of heart relates to its function. 	<p>Draw and label the internal structure of the heart</p> <p>Draw and state the structural differences between arteries, veins and capillaries</p> <ul style="list-style-type: none"> • Practical activity: <p>Determine the effects of physical activity on heart rate/pulse</p> <p>Observe the structure of a cows heart.</p> <p>https://www.cliffsnotes.com/study-guides/biology/biology/blood-and-circulation/human-circulatory-system</p>

Grade 9 Biology Syllabus

					<ol style="list-style-type: none">8. Explain the mechanism the heart utilizes in pumping blood.9. Give the name of the structures in the heart which prevents the back flow of blood.10. Identify the three blood vessels that blood travels through to get to and from cells11. State how the different structure of each blood vessel relates to its function.12. Identify the different components of blood	
--	--	--	--	--	--	--

Grade 9 Biology Syllabus

Term/ Month	Topic/Unit1	Major Concept	General Objectives	Specific Objectives	Teaching Strategies	Suggested Learning Activities
Term 2 January	Transport and Nutrition in Plants	Structure of leaf Photosynthesis Xylem and Phloem	<p>a) Describe the external and internal structure of the leaf- <i>drawings necessary.</i></p> <p>b) Relate the structure of the leaf to its function.</p> <p>c) State how the plant utilizes the carbohydrate it produces.</p> <p>d) State the importance of a transport system in plants.</p>	<ol style="list-style-type: none"> 1. Define the term photosynthesis. 2. Identify the raw materials and end products of photosynthesis. 3. Describe photosynthesis in green plants. 4. Identify the stages of photosynthesis. 5. Relate the structure of the leaf of a flowering plant to its function in photosynthesis. 6. Identify and describe transport vessels in plants (xylem and phloem) <i>drawings necessary.</i> 	<p>Discussion</p> <p>Peer Teaching</p>	<p>Draw the external and internal structure of the leaf, phloem and xylem.</p> <p>Practical activities: 1) Do test to identify the xylem in leaf 2) Determine the effects of wind, light and temperature on transpiration rate. 3) Test leaf for starch</p> <p>https://byjus.com/biology/nutrition-in-plants/</p>

Grade 9 Biology Syllabus

				7. Relate the structure of the transport vessels in plants leaf to their functions		
--	--	--	--	--	--	--

Grade 9 Biology Syllabus

Term/ Month	Topic/Unit1	Major Concept	General Objectives	Specific Objectives	Teaching Strategies	Suggested Learning Activities
<p>Term 2</p> <p>February</p>	<p>Nutrition in man</p>	<p>Essential nutrients present in food.</p> <p><i>Protein, fats, carbohydrate, water, minerals and vitamins</i></p> <p>Deficiency Diseases and their symptoms.</p>	<p>a) State importance of feeding/nutrition in man.</p> <p>b) State the six essential nutrients present in food <i>Protein, fats, carbohydrate, water, minerals and vitamins</i></p> <p>c) Describe a balance diet</p> <p>d) Classify and describe each nutrient in (b) -<i>give examples where applicable</i></p> <p>e) State the importance of each nutrient in (b)</p>	<p>1. Explain what is meant by the term nutrition.</p> <p>2. Identify the three types of nutrition- saprothrophs, heterotrophs and autotrophs.</p> <p>3. Explain why nutrition is important in the survival of man.</p> <p>4.. Define the term nutrients</p> <p>5. Classify nutrients as organic or inorganic or as Macronutrients or Micronutrients.</p> <p>5. Identify some nutrients that are needed by the body and state their function to include <i>Protein, carbohydrates, fats, vitamin A, B, C, D, E and K, BI,</i></p>	<p>Peer teaching</p> <p>Project</p> <p>Research</p> <p>Use of videos and experiments.</p>	<p>Oral group Presentation</p> <p>Experiment for nutrients in various food Samples.</p> <p>Construct a table to show the different types of nutrients, along with their deficiency diseases and their function.</p>

Grade 9 Biology Syllabus

				<p><i>Minerals such as iron, calcium, iodine, phosphorous etc.</i></p> <p>6. Outline the deficiency diseases of the aforementioned nutrients above and their symptoms</p> <p>6. Define the term diet</p> <p>7. Explain what is digestion</p>		
--	--	--	--	--	--	--

Grade 9 Biology Syllabus

Term/ Month	Topic/Unit1	Major Concept	General Objectives	Specific Objectives	Teaching Strategies	Suggested Learning Activities
March/April	Nutrition in man- Digestion	Enzyme Activity Digestion Absorption	<ul style="list-style-type: none"> Describe the major features of enzymes <i>Sensitivity to pH and Temperature</i> <i>Specific and reusable (needed in small quantities)</i> Describe the structure of the digestive system <i>diagram necessary</i> Identify the end products of fat, carbohydrate and protein digestion Describe the absorption of amino acids, fatty acids and glycerol and glucose by the villi <i>diagram of villus necessary</i> 	<ol style="list-style-type: none"> Classify digestion into two forms; chemical and physical-<i>note the difference.</i> Describe the role and structure of the teeth in Digestion Describe how the alimentary canal works Define the term persitalsis Explain the function and role of the epiglottis in digestion. Identify the different parts of the alimentary canal and explain what happens to food upon reaching it. Define the term 	<p>Peer teaching</p> <p>Power Point presentation</p> <p>Discussion</p> <p>Use of videos and experiments.</p>	<p>Group presentation</p> <p>Draw and label the diagram of a typical tooth and state the function of each part in a separate table.</p> <p>Plan and Design experiment <i>Determine the effects of salivary amylase on starch</i> <i>Determine the effects of temperature on enzyme</i></p> <p>Construct a model of digestive system.</p> <p>https://www.cliffsnotes.com/study-guides/biology/biology/nutrition-and-digestion/human-digestive-system</p>

Grade 9 Biology Syllabus

				<p>enzyme.</p> <p>8. Describe the digestion of fat, carbohydrate and protein along the alimentary canal- <i>include the role of pH and enzymes at each stage</i></p> <p>9. State the names of the enzyme that carry out chemical digestion at the different parts of the alimentary canal.</p> <p>10. Define the term villi and state their role in the process of absorption.</p>		
--	--	--	--	--	--	--

Grade 9 Biology Syllabus

Term/ Month	Topic/Unit1	Major Concept	General Objectives	Specific Objectives	Teaching Strategies	Suggested Learning Activities
April-May	Reproduction in man	<p>Puberty</p> <p>Reproductive System</p> <p>Birth Control</p> <p>Sexually transmitted Infection</p>	<ul style="list-style-type: none"> • Describe the importance of reproduction to man. • Understand the development of male and female Secondary Sexual Characteristics during puberty. • Appreciate and reate the design of the human body to it's reproductive function- <i>drawings of the male and female reproductive organs necessary</i> • Understand the use of different types of contraceptive methods. 	<ol style="list-style-type: none"> 1. Identify the importance of reproduction. 2. Define puberty. 3. Identify the major physical changes that takes place in boys and girls during puberty. 4. Discuss methods of birth control and their role in reducing pregnancy and the spreading of STIs. Brith control methods to incude: <ul style="list-style-type: none"> -<i>Hormonal eg. pills</i> -<i>Barrier eg.condoms</i> -<i>Natural eg. Rhymth Method</i> -<i>Surgurical eg. Vasectomy</i> 5. Define the abbreviation STI. 	<p>Power point presentation</p> <p>Peer teaching Discussion</p>	<p>Research Projects</p> <p>Interviews</p> <p>Draw reproductive Systems Male Female</p>

Grade 9 Biology Syllabus

				<p>6. Discuss common sexually transmitted infections include signs, symptoms and treatment.</p> <p><i>STIs to be studied includes</i> <i>Gonorrhea</i> <i>HIV-AIDS</i> <i>Herpes</i> <i>Human Papilloma Virus</i> <i>Genital Warts</i> <i>Chlamydia</i></p>		
--	--	--	--	---	--	--