

2021 Annual Teaching Plan – Term 1: LIFE SCIENCES: Grade 10 STARTING WITH LIFE AT MOLECULAR, CELLULAR AND TISSUE LEVEL

Term 1 45 days	Week 1 27-29 January (3 days)	Week 2 1-5 February (5 days)	Week 3 8-12 February (5 days)	Week 4 15-19 February (5 days)	Week 5 22-26 February (5 days)	Week 6 1-5 March (5 days)	Week 7 8-12 March (5 days)	Week 8 15-19 March (5 days)	Week 9 23-26 March (4 days)	Week 10 29-31 March (3 days)
CAPS Topic	(CAPS pg. 22) Orientation to Life Sciences	(CAPS pg. 23) The Chemistry of Life			(CAPS pg. 25) Cells: The basic unit of life			(CAPS pg. 26) Cell division: mitosis		
Core Concepts, Skills and Values	How science works and scientific skills, careers and subject combinations	Molecules for life: Organic molecules made up of C, H, O and N, P. Cells are made up of proteins, carbohydrates, lipids, nucleic acids and vitamins. (only basic structural detail required) Inorganic compounds Water: 2 H and 1 O Minerals: e.g. Na, K, Ca, P, Fe, I, nitrates, phosphates. Macro and micro elements. Main functions and deficiency diseases	Organic compounds Carbohydrates – monosaccharide's (single sugars) e.g. glucose, fructose; disaccharides (double sugars) e.g. sucrose, maltose; polysaccharides (many sugars) e.g. starch, cellulose, glycogen Lipids (fats and oils) – 1 glycerol and 3 fatty acids: unsaturated and saturated fats. Cholesterol in foods. Heart disease	Organic compounds Protein – amino-acids (C, H, O and N and some have P, S, Fe). Proteins are sensitive to temperature and pH; loss of structure and function. Role of enzymes in breaking down/synthesizing molecules Influence of temperature and pH on enzyme action Lock and key model of how enzymes work Enzymes in everyday life, e.g. washing powders. Mention of Nucleic acids: DNA and RNA – Consisting of C, H, O, N and P (No details of structure required). Vitamins e.g. A, one of B vitamins, C,D and E	Cell structure Molecular make-up: Cells are mostly made of proteins, carbohydrates, lipids, nucleic acids and water Cell structure and function: roles of organelles Cell wall – support structure in plant cells only. Cell membrane – fluid mosaic model, boundaries and transport: movement across membranes: diffusion, osmosis and active transport. Nucleus, chromatin material, nuclear membrane, nucleopores, nucleolus: the control centre, heredity. Cytoplasm- storage, circulation of materials	Cell structure and function: roles of organelles Mitochondria – release of energy during cell respiration Ribosomes – protein synthesis Endoplasmic reticulum (rough and smooth) transport systems Golgi –body – assemble secretion	Cell structure and function: roles of organelles Plastids – production and storage of food, pigments Vacuole, lysosomes, vesicles – storage, digestion, osmoregulation Relate structure and location of organelles to their functions. Cells differ in size, shape and structure in order to carry out specialized functions Differences between plant and animal cells	Cell division – mitosis Cell cycles including mitosis: interphase, mitosis (with names of phases) cytokinesis, growth. Continuous process of mitosis: division of cell to form two identical cells <ul style="list-style-type: none"> • Difference in telophase between plant and animal cells • Chromosomes: in nuclei of all cells, two chromatids, centromere Role of mitosis: growth and repair. Reproduction in some simple organisms Cancer (only brief description required)		Consolidation and revision
Requisite Pre-Knowledge	Scientific skills link to Grade 9	Revise the topic 'molecules' from Natural Sciences Grades 8 and 9			Grade 10: Revise organic and inorganic compounds – cells are mostly made up of proteins, carbohydrates, lipids, nucleic acids and water			Revise cell structure from Grade 9 and 10		
Resources (other than textbook) to enhance learning	Power Point slides and videos. Watch Telematics video on the scientific method at https://bit.ly/2nJnBel	Models: construct models of simple and more complex molecules using beads Analyse nutritional content on food packaging			Light microscopes, micrographs, microscopic slides, bio viewers and bio strips			Light microscopes, micrographs, microscopic slides, bio viewers and bio strips		
Informal Assessment	Revision questions on scientific skills	Revision questions on inorganic and organic compounds, practical work, draw diagrams to represent molecules. Practical work: food tests etc. – refer to pg.24 of CAPS Compare the Recommended Daily Allowance (RDA) with usual diet of individual learners. Draw a pie chart of the food types and discuss implications of the usual diet of learners			Practical work: microscope work, calculate size of a specimen on a micrograph using a scale line.			Revision questions, tests		Practical work – examine cell division
SBA (Formal Assessment)	TASK 1: PRACTICAL TASK (minimum 30 marks) - Weighting: 10%					TASK 2: FORMAL TEST (minimum 50 marks) - Weighting: 20%				

2021 Annual Teaching Plan – Term 2: LIFE SCIENCES: Grade 10 STARTING WITH LIFE AT MOLECULAR, CELLULAR AND TISSUE LEVEL

Term 2 51 days	Week 1 13 – 16 April (4 days)	Week 2 19 – 23 April (5 days)	Week 3 28 – 30 April (3 days)	Week 4 03 – 07 May (5 days)	Week 5 10 – 14 May (5 days)	Week 6 17 – 21 May (5 days)	Week 7 24 – 28 May (5 days)	Week 8 31 May – 4 June (5 days)	Week 9 07 – 11 June (5 days)	Week 10 14 – 18 June (4 days)	Week 11 21 – 25 June (5 days)	
CAPS Topic	(CAPS pg. 28) Animal tissues	(CAPS pg. 26) Plant tissues, (CAPS pg. 28) Organs	(CAPS pg. 28) Organs	(CAPS pg. 29) Support and transport systems in plants	(CAPS pg. 29) Support and transport systems in plants	(CAPS pg. 30) Support systems in animals	(CAPS pg. 32) Transport systems in animals					
Core Concepts, Skills and Values	<p>Introduce concept of a tissue as a group of similar cells adapted for a particular function: cell differentiation</p> <p>Animal tissues -epithelial -connective -muscle and -nerve tissue and some examples of each. Relationship between structure and function [no detail required – some tissue, e.g. blood and nerves in the reflex-arc, will be covered in more detail in relevant sections</p>	<p>Plant tissues Emphasis on the relationship between basic structure and function Plant tissues: xylem, Phloem, parenchyma, collenchyma, sclerenchyma, epidermis and meristematic tissue</p> <p>Anatomy of dicotyledonous plants -root and stem: distribution of different tissues -structure of cells in different tissues</p>	<p>Organs: Leaf structure Cross section of a dicotyledonous leaf to demonstrate and explain its structure in terms of its functions i.e. Photosynthesis, gas exchange and transport. Link with plant tissues, appropriate cell organelles, movement across membranes and movement of molecules into through and out of the leaf.</p>	<p>Transpiration Relationship between water loss and leaf structure</p> <p>Factors that affect the rate of transpiration: temperature light intensity wind humidity</p>	<p>Uptake of water and minerals into xylem in roots in xylem</p> <p>Transport of water and minerals to leaves</p> <p>Translocation of manufactured food from leaves to other parts of plant</p>	<p>Human skeleton</p> <ul style="list-style-type: none"> the axial skeleton: mention of facial bones, cranium, foramen magnum, palate and jaws. appendicular skeleton <p>Functions of skeleton</p> <ul style="list-style-type: none"> movement protection support storage of minerals hearing 	<p>Transport system Blood circulation system: pulmonary and systematic (double, closed) circulatory systems</p> <ul style="list-style-type: none"> heart and associated blood vessels heart: internal and external structure related to functioning cardiac cycle: flow of blood through the heart 	<p>Direction of blood flow: difference between oxygenated and deoxygenated blood in different parts of the system (diagram or schematic drawing)</p> <p>-lungs and pulmonary system; associated blood vessel</p> <p>-major organs and systematic system: Associated major blood vessels of brain, small intestine, liver kidney</p> <ul style="list-style-type: none"> Blood vessels: structure and functioning of arteries, veins with valves and capillaries 				Consolidation and Revision
Requisite Pre-Knowledge	Revise cells Grade 10	Revise cells Grade 10 Revise plant tissues, organelles, movement across membranes	Revise plant tissues	Revise diffusion and osmosis, plant tissues	Revise diffusion and osmosis, plant tissues	Revise musculoskeletal system from Grade 8, animal tissues from Grade 10	Revise circulatory system from Grade 9, revise animal tissues from Grade 10					
Resources (other than textbook) to enhance learning	Light microscopes, micrographs, microscopic slides, bio viewers and bio strips, wall charts	Light microscopes, micrographs, microscopic slides, bio viewers and bio strips, wall charts	Light microscopes, micrographs, microscopic slides, bio viewers and bio strips, wall charts	Light microscopes, micrographs, microscopic slides, bio viewers and bio strips, wall charts, potometer	Light microscopes, micrographs, microscopic slides, bio viewers and bio strips, wall charts, potometer	Model or photographs of human skeleton, long bone	Model of human heart, fresh heart from butchery, wall charts, stopwatch, microscope					
Informal Assessment	Practical work – draw cells that make up animal tissues	Practical work – draw cells that make up plant tissues Draw section of stem and root, labels and functions, tests, revision questions	Draw section of leaf, labels and functions, tests, revision questions	Practical work – investigate the factors that affect rate of transpiration, water uptake by the plants	Draw section of stem and root, labels and functions, tests, revision questions	Practical work – observe and draw a long bone,	Practical work: dissection of mammal heart, measuring of pulse rate, blood vessels drawings and labels and functions					
SBA (Formal Assessment)	TASK 3: ASSIGNMENT (50 marks) - Weighting: 20%					TASK 4: FORMAL TEST (minimum 50 marks) - Weighting: 20%						

2021 ANNUAL TEACHING PLAN – TERM 3: LIFE SCIENCES: GRADE 10 STARTING WITH LIFE AT MOLECULAR, CELLULAR AND TISSUE LEVEL

Term 3 52 days	Week 1 13 – 16 July (4 days)	Week 2 19 – 23 July (5 days)	Week 3 26 – 30 July (5 days)	Week 4 02 – 06 August (5 days)	Week 5 10 – 13 August (4 days)	Week 6 16 – 20 August (5 days)	Week 7 23 – 27 August (5 days)	Week 8 30 Aug. – 03 Sept (5 days)	Week 9 06 – 10 Sept (5 days)	Week 10 13 – 17 Sept (5 days)	Week 11 20 – 23 Sept (3 days)
CAPS Topic	(CAPS pg. 33) Biosphere to ecosystems						CAPS pg. 35) Biodiversity and classification		(CAPS pg. 36) History of Life on Earth		
Core Concepts, Skills and Values	Biosphere Concept of the biosphere. Inter-connectedness with and components of global ecosystems: hydrosphere, lithosphere, atmosphere Biomes Terrestrial and aquatic biomes of Southern Africa: how climate, soils and vegetation influence the organisms found in each. Location of different biomes in South Africa	Environment Concept of environment to show human activities in and interactions with the natural environment Abiotic and biotic factors. Effects on the community Ecosystems Concept of ecosystem Structure and ecosystem functioning:	Abiotic factors -physiographic factors (aspect, slope, altitude) -soil (pH, humus content, texture, water retention capacity, air content) -light (day length, seasonal changes) -temperature (effect of day/night, seasons) -water (water cycle, importance of wetlands) -atmospheric gases -wind Biotic factors -producers -consumers -decomposers	Energy flow Energy flow through ecosystems and relationship to trophic structure (food pyramids) -Trophic levels: producers, consumers (herbivores and carnivores and omnivores, decomposers)	Cycles Flow charts of the following: -nutrient -water -Oxygen	Cycles Flow charts of the following: -carbon -nitrogen cycles (names e.g. nitrates are required but no detail of chemistry is necessary)	Classification schemes a way of organizing biodiversity Brief history of classification: scientist attempt to classify organisms based on shared features. As information increases classification changes One of the currently accepted classification systems is the Five-kingdom system; Animalia, Plantae, Fungi, Protista and Monera (Bacteria) -naming things in science: species concept and binomial system. Linnaeus (Carl von Linnaeus) and his role in classification systems: Why do we use Latin? -differences between prokaryotes and eukaryotes	Main groupings of living organisms are bacteria, protists, fungi, plants and animals.	Life's History Different representations of the history of life on earth. The relationship to changes in climate (e.g. Increase in oxygen levels, ice ages) and geological events (e.g. movement of continents; introduction to biogeography); The three eras: Palaeozoic, Mesozoic and Coenozoic. Each era divided into periods (names of periods not to be memorized). Geological timescale Meaning and use of timescales (details not to be memorized)	Cambrian explosion Origins of early forms of all animal groups. Life-forms have gradually changed to become present life-forms. In the last four million years significant changes have occurred in species occurring in Africa (e.g. humans)	Consolidation and Revision
Requisite Pre-Knowledge	Revise circulatory system from Grade 9, revise animal tissues from Grade 10	Revise ecosystems from Grade 9					Revise biosphere to ecosystems		Revise biosphere to ecosystems		
Resources (other than textbook) to enhance learning	Model of human heart, fresh heart from butchery, wall charts, stopwatch, microscope	Identification guides and keys, access to an ecosystem, fieldwork, internet, magazines, newspaper articles					Photographs, micrographs, identification keys and guides		Museum, fossil sites, Internet and photographs. Watch the Telematics video on the history of life at https://bit.ly/33sEn00		
Informal Assessment	Practical work: dissection of mammal heart, measuring of pulse rate, blood vessels drawings and labels and functions	Case studies, tests, revision questions, fieldwork					Classification, practice questions and activities		Construct a timeline showing history of life, research missing link between dinosaurs and birds, hypotheses of extinctions		
SBA (Formal Assessment)	TASK 5: PRACTICAL TASK (minimum 30 marks) - SBA Weighting: 10%						Weighting: 20%		TASK 6: FORMAL TEST (minimum 50 marks) - SBA		

2021 Annual Teaching Plan – Term 4: LIFE SCIENCES: Grade 10 STARTING WITH LIFE AT MOLECULAR, CELLULAR AND TISSUE LEVEL

Term 4 47 days	Week 1 05 – 08 October (4 days)	Week 2 11 – 15 October (5 days)	Week 3 18-22 October (5 days)	Week 4 25 – 29 October (5 days)	Week 5 – 10 1 Nov – 8 Dec						
CAPS Topic	(CAPS pg. 36) History of Life on Earth				End-of-year examinations						
Core Concepts, Skills and Values	Mass extinctions There have been five, two of which are particularly important: 250mya (resulted in the extinction of about 90% of all life on Earth) and 65mya (resulted in the extinction of many species, including the dinosaurs) The rate extinction on the Earth at present is higher than at any time in the past. The present time has been called the sixth extinction	Fossil formation and methods of dating e.g. radiometric dating and relative dating	Revision	Preparation for exams	<table border="1"> <thead> <tr> <th>PAPER 1</th> <th>PAPER 2</th> </tr> </thead> <tbody> <tr> <td> Marks: 150 Time: 2½ hours <i>Learners must answer all 3 questions.</i> </td> <td> Marks: 150 Time: 2½ hours <i>Learners must answer all 3 questions.</i> </td> </tr> <tr> <td> Topics and marks: <i>Chemistry of Life – 33</i> <i>Cells: Basic units of life- 19</i> <i>Cell division (mitosis) – 19</i> <i>Plant and Animal Tissues – 28</i> <i>Plant organs – 9</i> <i>Support and transport systems: plants- 23</i> <i>Support systems: animals - 19</i> </td> <td> Topics and marks: <i>Transport systems in mammals – 32</i> <i>Biosphere to ecosystems – 54</i> <i>Biodiversity and classification – 21</i> <i>History of life on earth - 43</i> </td> </tr> </tbody> </table>	PAPER 1	PAPER 2	Marks: 150 Time: 2½ hours <i>Learners must answer all 3 questions.</i>	Marks: 150 Time: 2½ hours <i>Learners must answer all 3 questions.</i>	Topics and marks: <i>Chemistry of Life – 33</i> <i>Cells: Basic units of life- 19</i> <i>Cell division (mitosis) – 19</i> <i>Plant and Animal Tissues – 28</i> <i>Plant organs – 9</i> <i>Support and transport systems: plants- 23</i> <i>Support systems: animals - 19</i>	Topics and marks: <i>Transport systems in mammals – 32</i> <i>Biosphere to ecosystems – 54</i> <i>Biodiversity and classification – 21</i> <i>History of life on earth - 43</i>
PAPER 1	PAPER 2										
Marks: 150 Time: 2½ hours <i>Learners must answer all 3 questions.</i>	Marks: 150 Time: 2½ hours <i>Learners must answer all 3 questions.</i>										
Topics and marks: <i>Chemistry of Life – 33</i> <i>Cells: Basic units of life- 19</i> <i>Cell division (mitosis) – 19</i> <i>Plant and Animal Tissues – 28</i> <i>Plant organs – 9</i> <i>Support and transport systems: plants- 23</i> <i>Support systems: animals - 19</i>	Topics and marks: <i>Transport systems in mammals – 32</i> <i>Biosphere to ecosystems – 54</i> <i>Biodiversity and classification – 21</i> <i>History of life on earth - 43</i>										
Requisite Pre-Knowledge	Revise biosphere to ecosystems				Preparation for Final Examination Cognitive levels: Knowing Science – 40%; Understanding Science-25%; Applying scientific knowledge-20%; Evaluating, analysing and synthesising – 15% Degrees of difficulty for examination and test questions: Easy- 30%; Moderate - 40%; Difficult -25%; Very difficult – 5%						
Resources (other than textbook) to enhance learning	Museum, fossil sites, Internet and photographs. Watch the Telematics video on the history of life at https://bit.ly/33sEnO0										
Informal Assessment	Construct a timeline showing history of life, research missing link between dinosaurs and birds, hypotheses of extinctions										
SBA (Formal Assessment)	SBA Weighting: 60%				End-of-year examinations Weighting: 40%						