Life Sciences - Grade 11 – CAPS (2024)

Annual Teaching Plan - TERM ONE (10 weeks) - 46 DAYS (17 Jan – 20 March)

Week Number (Week Ending)	Completion Date	Topic for the week	INFORMAL ASSESSMENT		% Curriculum Coverage	SMT Signature and Date	FORMAL ASSESSMENT - SBA
			ACTIVITY /TASK/ INFORMAL TESTS	TICK			
Week 1 **3 days** **(19/01)**		Baseline assessment based on Grade 10 topics needed for Term 1 e.g. classification schemes, the nitrogen cycle. Revise scientific skills.			**6.97**		**Task 1:** **Practical** (Minimum 30 marks) Term Weighting –25% Year Weighting – 10% **Task 2:** **March Controlled Test** (1 hour - 50 marks) Term weighting – 75% Year weighting – 20%
Week 2 **5 days** **(26/01)**		**Micro- organisms**: **basic structure and general characteristics** of the following groups: viruses bacteria Protista fungi. The **roles** that these groups play in maintaining balance in the environment and web of life.	**Activity** Table on micro- organisms: names, basic structures, characteristics and diagrams. **INFORMAL TEST:** Life Sciences skills, values, investigations	☐ ☐	**18**		
Week 3 **5 days** **(02/02)**		**Symbiotic relationships** of bacteria such as nitrogen fixing bacteria in plants and *E. coli* in the human intestine. The effect and management of **one disease** from each of the four groups: - viruses (rabies, HIV/AIDS, influenza). - bacteria (blight, cholera, tuberculosis, anthrax). - protists (malaria) - fungi (rust, thrush, ringworm, athlete's foot). **INVESTIGATION** Growing cultures on agar plates, or bread-mould (fungus) on bread.	**Activity** Symbiotic relationships of nitrogen fixing bacteria in plants and *E. coli* in the human intestine **Activity** A table of **ONE disease** from each group indicating effect and management.	☐ ☐	**30.23**		

Week 4 **5 days** **(09/02)**		**Immunity**, including plants and animals' immune responses against the infecting micro- organisms. The use of drugs e.g., antibiotics; effect on micro-Organisms. Vaccinations (discuss briefly). The use of micro- organisms to produce medicines (e.g., insulin and antibiotics). Traditional technology to produce, e.g., beer, wine and cheese.	**Activity** Immunity, vaccinations using articles. **Activity** Effect of antibiotics on micro- organisms; use of micro- organisms to produce medicine; traditional technology to produce e.g. beer, wine and cheese. **INFORMAL TEST:** Biodiversity and classification of micro-organisms	☐ ☐ ☐	**41.86**		
Week 5 **5 days** **(16/02)**		Grouping of **Bryophytes and Pteridophytes** Grouping of **Gymnosperms and Angiosperms.** Use **simple diagrams** to identify an example of each group and a **comparative table** to demonstrate the presence /absence of following in the four groups: vascular tissue (xylem and phloem), true leaves and roots, seeds or spores fruit, decreasing dependence on water for reproduction from Bryophytes to Angiosperms.	**Activity** Phylogenetic trees and cladograms showing the evolutionary history of the four plant groups and major structural changes in their history of development. **Activity** Table indicating the differences between Bryophytes, Pteridophytes, Gymnosperms and Angiosperms in terms of vascular tissue, leaves and roots, seeds or spores and fruit also including drawings of the macroscopic parts: Bryophytes: moss plant Pteridophytes: rhizome, frond with sori gymnosperms: needles, cones and seeds; and Angiosperms: flower, fruit and seeds.	☐ ☐	**53.48**		
Week 6 **5 days** **(23/02)**		**Asexual and sexual reproduction**, name advantages and disadvantages of each	**Activity** Table indicating the differences between asexual and sexual reproduction showing advantages and disadvantages **INFORMAL TEST:** Biodiversity of Plants	☐ ☐	**65.17**		
Week 7 **5 days** **(01/03)**		**Flowers as reproductive structures** Adaptations for pollination through (different pollinators) wind, insects and birds (South African examples only) differences and similarities **INVESTIGATION** Dissect an example of each of the following types of flowers: wind pollinated, insect pollinated and bird pollinated. Record observations in a comparative Table	**INFORMAL TEST**: Flowers as reproductive structures	☐	**76.74**		

Week 8 **5 days** **(08/03)**		The concept of a phylum. Relationship between body plan and grouping of animals in phyla. **Six animal Phyla**: - Porifera, - Cnidaria, - Platyhelminthes, - Annelida, - Arthropoda - Chordata Use **simple diagrams** to identify an example of each phylum and a **comparative table** to demonstrate the following in the six phyla: **Key features** in respect of body plans: - symmetry and cephalisation - the number of tissue layers developed from embryo - the number of openings in the gut - coelom and blood systems. The role of invertebrates in agriculture and ecosystems. **INVESTIGATION** Select one phylum and design a poster to show diversity in that phylum in South Africa	**Activity** Calculate approximate surface area to volume ratios of selected examples of different animals of the six phyla.	☐	**88.37**		
Week 9 **5 days** **(15/03)**			**Activity** Construct a comparative table of these four key features in the six selected phyla and indicate the mode of living of each phyla. Include as many diagrams or pictures as possible. **Activity** The role of invertebrates in agriculture and ecosystems **INFORMAL TEST**: Biodiversity of Animals	☐ ☐ ☐	**100**		
Week 10 **3 days** **(20/03)** **Term Ends**		**Revision and Assessment**					

Life Sciences - Grade 11 – CAPS (2024)

Annual Teaching Plan - TERM TWO (11 weeks) - 52 DAYS (03 April – 14 June)

Week Number (Week Ending)	Completion Date	Topic for the week	INFORMAL ASSESSMENT		% Curriculum Coverage	SMT Signature and Date	FORMAL ASSESSMENT - SBA
			ACTIVITY /TASK/ INFORMAL TESTS	TICK			
Week 1 **3 days** **(05/04)**		Revise basic cell structure with focus on the chloroplast, leaf structure, mitochondria and plant and animal tissues from grade 9 and grade 10. Revise basic photosynthesis and respiration from grade 8.	**Activity** Draw and label diagrams of the leaf. Indicate the functions.	☐	**7.14**		**Task 4:** **Assignment** (Minimum 50 marks) Term Weighting – 25% Year Weighting – 20% **Task 5:** **June exam** (2 ½ hours – 150 marks) Term weighting – 75% Year weighting – 20%
Week 2 **5 days** **(12/04)**		**Process of photosynthesis** using words and symbols: The intake of raw materials, trapping and storing of energy, formation of food in chloroplasts and its storage. The release of oxygen. Mention only of light and dark phase **(*no biochemical detail of light and dark phases are required*).** **Importance of photosynthesis:** release of oxygen, uptake of carbon dioxide from atmosphere, food production (*trapping energy*)	**Activity** Use a diagram of a plant indicating the intake of raw materials, trapping and storing of energy, formation of food in chloroplasts and its storage and the release of Oxygen. **Activity** Draw a diagram of chloroplast. Indicate the location in the chloroplast where the light and dark phase take place. **INFORMAL TEST:** Plant organs: The leaf Plant organelle: The Chloroplast	☐ ☐ ☐	**19.04**		
Week 3 **5 days** **(19/04)**		Effects of variable amounts of light, carbon dioxide and temperature on the **rate of photosynthesis.** **Improve crop** yields in greenhouse systems, role of ATP as energy carrier in the cell. **ONE investigation** to explain the principles of the Scientific process: Light is necessary for photosynthesis (Infuse investigation throughout the topic)	**Activity** Use graphs to show effects of variable amounts of light, carbon dioxide and temperature on the rate of photosynthesis. **Activity** Case study on the role of carbon enrichment, optimum light and optimum temperatures in greenhouse systems to improve crop yield.	☐ ☐	**30.95**		

Week 4 **5 days** **(26/04)**		**INVESTIGATION** Basic scientific investigation skills with demonstrations or data interpretation on: Investigate photosynthesis by showing that light is necessary for photosynthesis.	**INFORMAL TEST:** Energy transformation to sustain life: Photosynthesis	☐	**41.86**	
Week 5 **4 days** **(03/05)**		**Process of respiration:** **Aerobic respiration**: in cytoplasm and mitochondria; use words and symbols: glycolysis, Krebs cycle and oxidative phosphorylation **(*no biochemical detail is required*)** **INVESTIGATION** Basic scientific investigation skills with demonstrations or data interpretation on: Investigate respiration by showing that CO_2 is produced by living organisms during respiration	**Activity** Diagram of a cell with cytoplasm and mitochondria. Use words and symbols indicating glycolysis, Krebs cycle and oxidative phosphorylation. **Activity** The process of anaerobic respiration and the role it plays in the food industry. *(Suggested as an investigation)* **INFORMAL TEST**: Energy transformation to sustain life: Cellular Respiration.	☐ ☐ ☐	**52.38**	
Week 6 **5 days** **(10/05)**		**Anaerobic respiration**: production of lactic acid in muscles during exercise; words and symbols **(no biochemical detail of process is required):** The role of anaerobic respiration in the industry, e.g., beer brewing and bread making. **Comparison** between aerobic and anaerobic respiration. **TWO investigations** to explain the principles of the Scientific process: - O_2 is required by respiration - CO_2 is produced by living organisms during respiration (Infuse investigations throughout the topic) **INVESTIGATION** Explain the principles of the Scientific process: CO_2 is produced by living organisms during respiration.			**64.23**	

Week 7 **5 days** **(17/05)**		The **differences in dentition** for herbivorous, carnivorous and omnivorous lifestyles in terms of nutritional requirements and energy relationships (*link with ecology – food chains*) **Human nutrition** The **macro- structure** of the alimentary canal and associated organs and the **functions** of the different parts. **INVESTIGATION** Obtain intestines of a sheep from a butcher and trace the passage that food will take. Cut open the stomach, portion of the small intestine and a portion of the large intestine to compare the structure of the wall in each.	**Activity** Table with the differences in dentition for herbivores, carnivores and omnivores' lifestyles in terms of nutritional requirement and energy relationships with diagrams.	☐	**76.19**		
Week 8 **5 days** **(24/05)**		The process of ingestion, digestion, absorption, assimilation and egestion and the significance of each: **Mechanical or physical digestion:** types and functions of different kinds of teeth, processes of chewing. Peristalsis. **Chemical digestion:** Enzymes: functions of carbohydrases, proteases and lipases: where produced; substrate, pH and end-products *(Specific enzymes need not be named – link to enzyme activity)*	**Activity** Diagram of the human digestive system with labels and functions of each part. Include mechanical and chemical digestion. **Activity** Diagram of ssmall intestine and villi to show adaptations for absorption of digested food.	☐ ☐	**80.95**		
Week 9 **5 days** **(31/05)**		**Absorption:** small intestine as a region of most absorption of digested food; adaptations to increase surface area. Structure (to tissue level) and significance of villi. Importance of hepatic portal system in the transport of absorbed food to the liver and then through hepatic vein to the rest of the body. **Assimilation:** incorporation of glucose and amino acids, and the breakdown of alcohol, drugs and hormones. **Egestion** **Homeostatic control**, which involves the hormonal control of blood sugar levels. ***(Links with Gr 12)***	**Activity** Diagram of hepatic portal system explaining assimilation of products of digestion and breakdown of relevant substances. **Activity** Schematic representation of the control of blood sugar Levels. **INFORMAL TEST**: Animal Nutrition and Homeostatic Control	☐ ☐	**100**		

Week 10 **5 days** **(07/06)**		**Revision and Assessment**					
Week 11 **5 days** **(14/06)** **END OF TERM**		**Revision and Assessment**					

Life Sciences - Grade 11 – CAPS (2024)

Annual Teaching Plan - TERM THREE (11 weeks) - 53 DAYS (09 July – 20 September)

Week Number (Week Ending)	Completion Date	Topic for the week	INFORMAL ASSESSMENT		% Curriculum Coverage	SMT Signature and Date	FORMAL ASSESSMENT - SBA
			ACTIVITY /TASK/ INFORMAL TESTS	TICK			
Week 1 **4 days** **(12/07)**		Revise relevant body systems from Grade 9 and ecology from Grade 8			**9.3**		**Task 5:** **Practical** (Minimum 30 marks) Term Weighting –25% Year Weighting – 10% **Task 6:** **September Controlled Test** (1 hour - 50 marks) Term weighting – 75% Year weighting – 20%
Week 2 **5 days** **(19/07)**		**Gaseous exchange:** Distinguish between cellular respiration, breathing and gas exchange. Require-ments of efficient gas exchange organs: Large surface area, thin, moist, well ventilated, protected, transport system **INVESTIGATION** Observe and investigate the structure of the lungs, diaphragm, associated pulmonary blood vessels and the heart of a pig or a sheep obtained from a butcher.	**Activity** Tabulate the differences between cellular respiration, breathing and gas exchange. **Activity** Requirements of efficient gas exchange organs.	☐ ☐	**20.93**		

Week 3 **5 days** **(26/07)**		**Human Gas exchange:** The structure (macro and tissue level) location, adaptations and functioning of the ventilation system: trachea, epiglottis, bronchi, bronchioles, lungs, ribs, intercostal muscles, diaphragm, alveoli. Ventilation of the lungs: Gaseous exchange in alveoli. The transport of gases around the body. Gaseous exchange in tissues; and composition of inspired air vs. expired air. Analyse data. Homeostatic control of breathing. ***(Links with Gr 12)*** **INVESTIGATION** Construct a model of the human breathing system. Explain the limitations of the model. Demonstrate that expired air contains carbon dioxide. **INVESTIGATION** Measure and compare the depth of breathing of two or more learners and the effect of exercise on breathing/pulse rate. Interpret data on depth and rate of breathing.	**Activity** Diagram of the human breathing system with labels and functions. Including ventilation of lungs. **Activity** Analyse and interpret data showing the effects of altitude on the number of red blood cells and the consequent effect on athletes at different altitudes. **Activity** Homeostatic control of Breathing. **INFORMAL TEST**: Gaseous exchange in humans and Homeostatic control	☐ ☐ ☐ ☐	**32.56**		
Week 4 **5 days** **(02/08)**		**Excretion in various organs:** Brief role of the following: the lungs, the kidneys and bladder the liver, the alimentary canal (gut), the skin. Substances secreted by each and the origins of these substances. **INVESTIGATION** Dissection of a sheep's/pig's kidney. Use a worksheet to identify: capsule, cortex, medulla, pyramids, blood vessels, pelvis, ureter and hilum. Draw and label the dissected kidney.	**Activity** Tabulate various excretory organs and their secretions and excretions. Include the substances secreted and their origin where applicable	☐	**44.19**		

Week 5 **4 days** **(08/08)**		**Urinary system** The structure of the urinary system. Position of kidneys, ureters, bladder, urethra. Kidney: structure and functioning, removal of urea and excess water and salts, re-absorption of glucose and some salts. Nephron: structure and functioning, Ultra-filtration, re-absorption, tubular excretion, pH control, formation of urine. Homeostatic control of water and salts: Role of ADH and Aldosterone. ***(Links with Gr 12)***	**Activity** Diagram of the urinary system of the human with labels and functions. **Activity** Longitudinal section through the kidney. Label and Functions. **Activity** Diagram of nephron with labels and functions. Use arrows to indicate the direction of urine production. **Activity** Homeostatic control of water and salts: role of ADH and aldosterone. **INFORMAL TEST**: Excretion in Humans and Homeostatic control.	☐ ☐ ☐ ☐ ☐	**53.49**		
Week 6 **5 days** **(16/08)**		**Population size** influenced by: Immigration, emigration, mortality, natality, fluctuations and limiting factors, carrying capacity. Logistic and geometric growth curves with phases. **INVESTIGATION** Determine the size of a population by quadrant or simple sampling; simulated mark/recapture. Collect and record data, interpret data. Calculate/ estimate the population size.	**Activity** **Case study**: Rationale for culling, e.g., elephants in the Kruger National Park as an example of an application of estimating population size. **INFORMAL TEST**: Factors influencing population size, Growth curves	☐ ☐	**65.17**		
Week 7 **5 days** **(23/08)**		**Interactions in the environment:** **Predation**: Two South African examples of predator-prey relationships: graphs **Competition**: Interspecific: for light, space, water, shelter and food Intraspecific: for food, access to mates, water, space, and shelter; survival is determined by access to the above, ecological niches. **Specialisation:** Competitive exclusion and resource partitioning; discuss one example of co-existence in animals and one example in plants.	**Activity** Population size including graphs on logistic and geometric growth. **Activity** Tabulate interactions in the Environment **INFORMAL TEST:** - Predation - Competition - Specialisation	☐ ☐ ☐	**76.74**		

Week 8 **5 days** **(30/08)**		**Parasitism**: Two examples from South Africa; one species benefits. **Mutualism**: Two examples from South Africa; both species benefit. **Commensalism**: Two examples from South Africa.	**Activity** Draw a life cycle of the bilharzia parasite or tapeworm (Simplify larval stages) **INFORMAL TEST:** Symbiotic relationships	☐ ☐	**88.37**		
Week 9 **5 days** **(06/09)**		**Human Population:** Reasons for exponential growth: Age and gender distributions for different countries including South Africa. Forecast of South Africa's population growth over the next twenty years and predict possible consequences for the environment.	**Activity** Human population. **INFORMAL TEST:** Human population	☐ ☐	**100**		
Week 10 **5 days** **(13/09)**		**Revision and Assessment**					
Week 11 **5 days** **(20/09)** **END OF TERM**		**Revision and Assessment**					

Life Sciences - Grade 11 – CAPS (2024)

Annual Teaching Plan - TERM FOUR (11 weeks) - 52 DAYS (01 October - 11 December)

Week Number (Week Ending)	Completion Date	Topic for the week	INFORMAL ASSESSMENT		% Curriculum Coverage	SMT Signature and Date	FORMAL ASSESSMENT - SBA
			ACTIVITY /TASK/ INFORMAL TESTS	TICK			
Week 1 **4 days** **(04/10)**		Causes and consequences of the following (relate to conditions and circumstances in **South Africa):** **The atmosphere and climate change** Carbon dioxide emissions Concept of 'carbon footprint' and the need to reduce the carbon footprint Deforestation, Greenhouse effect, enhanced greenhouse effect and global warming: desertification, drought and floods Methane emissions, Ozone depletion.			**28.57**		**SBA** Year Weighting – 40% **Task 7:** **Final Examinations** **Paper 1** (2 ½ hours - 150 marks) **Paper 2** (2 ½ hours - 150 marks) Year weighting – 60%
Week 2 **5 days** **(11/10)**		**Water Availability:** Construction of dams, Destruction of wetlands, Poor farming practices, Droughts and floods, Exotic plantations and depletion of water table, Boreholes and effects on aquifers, Wastage, Cost of water. **Quality:** Water for domestic use, industry, agriculture and mining: pollution, diseases, eutrophication and algal bloom, The effect of mining on quality of water, Thermal pollution, The need for water purification and recycling, Alien plants e.g.,*Eichhornia.* **Food security** (link with population ecology dynamics) Human exponential population growth, Droughts and floods climate change), Poor farming practices: monoculture; pest control; loss of topsoil and the need for fertilizers,	**Activity** Case study on Rhino poaching and suggestions on how it can be prevented	☐	**64.23**		
		Alien plants and reduction of agricultural land. The loss of wild varieties: impact on gene pools Genetically engineered foods; Wastage.		☐			

		INVESTIGATION Analyse the solid waste generated in the household in one week, including paper, metals and plastic. Estimate the percentage that could be recycled or reused.					
Week 3 **5 days** **(18/10)**		**Loss of Biodiversity** (the sixth extinction) Habitat destruction: farming methods, e.g. overgrazing and monoculture, golf estates, mining, urbanisation, deforestation; loss of wetlands and grasslands Poaching, e.g., for rhino horn, ivory and 'bush meat'; Alien plant invasions: control using mechanical, chemical and biological methods; and Indigenous knowledge systems and the sustainable use of the environment e.g., devils' claw, rooibos, fynbos, the African potato (Hypoxis) and Hoodia.	**INFORMAL TEST:** -Climate change -Water availability and quality -Loss of biodiversity	☐	**100**		
Week 4 **5 days** **(25/10)**		**Revision paper 1 and 2**					

Weeks 5 -10

33 days

(01/11– 11 12)

FINAL EXAMINATION (Two Papers)

Paper 1	Paper 2
Marks: 150 **Time: 2½ hours**	**Marks: 150** **Time: 2½ hours**
Photosynthesis: 32	Biodiversity of Microorganisms:29
Animal Nutrition: 32	Biodiversity of Plants in Reproduction: 29
Respiration: 22	Biodiversity in animals: 18
Gaseous Exchange: 32	Population Ecology: 37
Excretion: 32	Human Impact On the Environment: 37

Cognitive levels:
Knowing science - 40%
Understanding science - 25%
Applying scientific knowledge - 20%
Evaluating, analysing and synthesising science knowledge - 15%

Degrees of difficulty for examination and test questions:
Easy - 30%
Moderate - 40%
Difficult - 25%
Very difficult - 5%