ANNUAL TEACHING PLAN: LIFE SCIENCES: GRADE 11 **TERM 1: 15 January to 28 March 2025**

TERM 1 (52 days)	**Week 1 15–17 Jan (3)**	**Week 2 20–24 Jan (5)**	**Week 3 27–31Jan (5)**	**Week 4 03-07 Feb (5)**	**Week 5 10–14 Feb (5)**	**Week 6 17–21 Feb (5)**	**Week 7 24–28 Feb (5)**	**Week 8 03–07 March (5)**	**Week 9 10–14 March (5)**	**Week 10 17–20 March (4)**	**Week 11 24–28 March (5)**
CAPS Topics	**ORIENTATION**	**BIODIVERSITY AND CLASSIFICATION OF MICROORGANISMS** (CAPS p 39)			**BIODIVERSITY OF PLANTS** (CAPS p 40)			**BIODIVERSITY OF ANIMALS** (CAPS p 41)			
Core Concepts, Skills and Values	Baseline assessment based on Grade 10 topics needed for Term 1, e.g. classification schemes, the nitrogen cycle. Revise **scientific skills**.	**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	**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)	**Immunity**, including plants and animals' immune responses of 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.	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 Angiosperm	**Asexual and sexual reproduction**, name **advantages** and **disadvantages** of each.	**Flowers as reproductive structures** **Adaptations** for pollination through (different pollinators) wind, insects and birds (South African examples only) differences and similarities	**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 **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 (e.g., pollination, decomposition, soil aeration etc.)	
Pre-Knowledge	**BIODIVERSITY, CLASSIFICATION & ECOSYSTEMS GRADE 10**										
Daily activities		**Activity 1** Table on micro-organisms: names, basic structures, characteristics and diagrams.	**Activity 2** Symbiotic relationships of nitrogen fixing bacteria in plants and *E.coli* in the	**Activity 4** Immunity, vaccinations using articles **Activity 5** Effect of antibiotics on micro-	**Activity 6** Phylogenetic trees and cladograms showing the evolutionary history of the four plant groups and major structural	**Activity 8** Table indicating the differences between asexual and sexual		**Activity 9** Calculate approximate surface area to volume ratios of selected examples of	**Activity 10** Construct a comparative table of these four key features in the six selected phyla and	**Activity 11** The role of invertebrates in agriculture and ecosystems	

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CAPS Topics	**ORIENTATION**	**BIODIVERSITY AND CLASSIFICATION OF MICROORGANISMS** (CAPS p 39)			**BIODIVERSITY OF PLANTS** (CAPS p 40)			**BIODIVERSITY OF ANIMALS** (CAPS p 41)			
			human intestine. **Activity 3** A table of ONE disease from each group indicating effect and management	organisms; use of micro-organisms to produce medicine; traditional technology to produce e.g. beer, wine and cheese.	changes in their history of development **Activity 7** 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.	reproduction showing advantages and disadvantages.		different animals of the six phyla.	indicate the mode of living of each phyla. Include as many diagrams or pictures as possible.		
Investigations/Experiments		**INVESTIGATION 1** Growing cultures on agar plates, or bread mould (fungus) on bread.					**INVESTIGATION 2** Dissect an example of each of the following types of flowers: - wind pollinated - insect pollinated - bird pollinated Record observations in a comparative table.		**INVESTIGATION 3** Select one phylum and design a poster to show diversity in that phylum in South Africa.		
Informal Tests		**Baseline test 22 Jan 2025**		**Informal Test 1**			**Informal Test 2**				
SBA (Formal Assm)	**TASK 1: Practical (minimum mark = 30 marks)** **TASK 2: Formal Test (minimum mark = 50 marks)**										
Date completed											

Term 2 (51 days)	**Week 1 8-11 April (4)**	**Week 2 14-17 April (4)**	**Week 3 22-25 April (4)**	**Week 4 5-9 May (5)**	**Week 5 12-16 May (5)**	**Week 6 19-23 May (5)**	**Week 7 26-30 May (5)**	**Week 8 2-6 June (5)**	**Week 9-11 9-27 June (14)**
CAPS Topics	**ORIENTATION**	**PHOTOSYNTHESIS** (CAPS p 42)		**CELLULAR RESPIRATION** (CAPS p 45)		**ANIMAL NUTRITION (CAPS p 43) (5 days)**			
Core Concepts, Skills and Values	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	**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 details of light and dark phases are required).* **Importance of photosynthesis:** -release of oxygen, -uptake of carbon dioxide from atmosphere, -food production (trapping energy)	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)	**Process of respiration** **Aerobic respiration**: in cytoplasm and mitochondria; use words and symbols: glycolysis, Krebs cycle and oxidative phosphorylation **(no biological detail is required)**	**Anaerobic respiration** Production of lactic acid in muscles during exercise; word 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	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	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 carbohydrase, proteases and lipases: where produced; substrate, pH and end-products *(Specific enzymes need not be named – link to enzyme activity)* **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	**JUNE EXAMINATION**
Pre-Knowledge	CELL STRUCTURE: CHLOROPLASTS & LEAF STRUCTURE GR 10					HUMAN SYSTEMS GR 9			

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CAPS Topics	**ORIENTATION**	**PHOTOSYNTHESIS** (CAPS p 42)		**CELLULAR RESPIRATION** (CAPS p 45)		**ANIMAL NUTRITION (CAPS p 43) (5 days)**			
Daily activities	**Activity 12** Use a diagram of a leaf and provide labels. Indicate the functions.	**Activity 13** 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 14** Draw a diagram of chloroplast. Indicate the location in the chloroplast where the light and dark phase take place.	**Activity 15** Use graphs to show effects of variable amounts of light, carbon dioxide and temperature on the rate of photosynthesis. **Activity 16** Case study on the role of carbon enrichment, optimum light and optimum temperatures in greenhouse systems to improve crop yield.	**Activity 17** Diagram of a cell with cytoplasm and mitochondria. Use words and symbols indicating glycolysis, Krebs cycle and oxidative phosphorylation **Activity 18** The process of anaerobic respiration and the role it plays in the food industry. (Suggest as an investigation)	**Activity 18** The process of anaerobic respiration and the role it plays in the food industry. (Suggest as an investigation)	**Activity 19** Table with the differences in dentition for herbivores, carnivores and omnivores' lifestyles in terms of nutritional requirements and energy relationships with diagrams.	**Activity 20** Diagram of the human digestive system with labels and functions of each part. Include mechanical and chemical digestion. **Activity 21** Diagram of small intestine and villi to show adaptations for absorption of digested food.	**Activity 22** Diagram of hepatic portal system explaining assimilation of products of digestion and breakdown of relevant substances. **Activity 23** Schematic representation of the control of blood sugar levels	
Investigations/Experiments			**INVESTIGATION 4 Basic scientific investigation skills** with demonstrations or data interpretation on*: Investigate* ***photosynthesis*** *by showing that light is necessary for photosynthesis*.	**INVESTIGATION 5** Basic scientific investigation skills with demonstrations or data interpretation on: Investigate respiration by showing that O_2 is required by living organisms during respiration **INVESTIGATION 6** Explain the principles of the Scientific process: *CO_2 is produced by living organisms during respiration*	**INVESTIGATION 6** Explain the principles of the Scientific process: *CO_2 is produced by living organisms during respiration*	**INVESTIGATION 7** 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.			
Informal Tests			**Informal test 3**	**Informal test 4**					
SBA (Formal Assessment)	**TASK 3: Assignment (minimum mark = 50 marks)** **TASK 4: June Examination (150 marks)**								
Date completed									

ANNUAL TEACHING PLAN: LIFE SCIENCES: GRADE 11 **TERM 3: 22 July to 3 October 2025**

Term 3 52	**Week 1** 22–25 July (4)	**Week 2** 28 July–1 Aug (5)	**Week 3** 04-08 Aug (5)	**Week 4** 11-15 Aug (5)	**Week 5** 18-22 Aug (4)	**Week 6** 25-29 Aug (5)	**Week 7** 01–05 Sept (5	**Week 8** 8-12 Sept (5)	**Week 9** 15-19 Sept (5)	**Week 10** 22-26 Sept (4)	**Week11** 29 Sept-3 Oct (5)
CAPS Topics	**ORIENTATION**	**GASEOUS EXCHANGE** (CAPS p 46)			**EXCRETION IN HUMANS** (CAPS p 48)			**POPULATION ECOLOGY** (CAPS p 49)			
Core Concepts, Skills and Values	□Revise relevant body systems from Grade 9 and ecology from Grade 8	**Gaseous exchange** □Distinguish between cellular respiration, breathing and gas exchange. □Requirements of efficient gas exchange organs: -Large surface area -Thin -Moist -Well ventilated -Protected -Transport system	**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; -Composition of inspired air vs. expired air – analyse data.	□Homeostatic control of breathing. (Links with Grade 12)	**Excretion in various organs:** □Brief role of the following: -lungs; -kidneys -bladder; -liver; -alimentary canal (gut); -skin. □Substances secreted by each and the origins of these substances	**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 Grade 12)	**Population size** □influenced by: -Immigration, -emigration, -mortality, -natality, -fluctuations □limiting factors carry capacity. □Logistic and geometric growth curves with phases.	**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; □**Parasitism**: two examples from South Africa; one species benefits □**Mutualism**: two examples from South Africa; both species benefit; □**Commensalism**: two examples from South Africa	**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.	**Consolidation & revision**
Pre-Knowledge		HUMAN SYSTEMS GR 9 & LUNGS & PULMONARY SYSTEM GR 10			HUMAN SYSTEMS GR 9					ECOSYSTEMS GR 10	
Daily activities		**Activity 24** Tabulate the differences between cellular respiration, breathing and gas exchange.	**Activity 26** Diagram of the human breathing system with labels and functions. Including ventilation of lungs.	**Activity 28** Homeostatic control of breathing	**Activity 29** Tabulate various excretory organs and their secretions and excretions. Include the substances secreted and their	**Activity 30** Diagram of the urinary system of the human with labels and functions.	**Activity 33** Homeostatic control of water and salts: role of ADH	**Activity 34** **Case study**: Rationale for culling, e.g. elephants in the Kruger National Park as an example of an	**Activity 35** Population size including graphs on logistic and geometric growth.	**Activity 38** Human population	

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CAPS Topics	**ORIENT ATION**	**GASEOUS EXCHANGE** (CAPS p 46)			**EXCRETION IN HUMANS** (CAPS p 48)			**POPULATION ECOLOGY** (CAPS p 49)			
		Activity 25 Requirements of efficient gas exchange organs	**Activity 27** 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		origin where applicable.	**Activity 31** Longitudinal section through the kidney. Label and functions **Activity 32** Diagram of nephron with labels and functions. Use arrows to indicate the direction of urine production.	and aldostero ne.	application of estimating population size	**Activity 36** Tabulate interactions in the environment **Activity 37** Draw a life cycle of the bilharzia parasite or tapeworm (simplify larval stages).		
Investigations/ Experiments			**INVESTIGATION 8** 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. **INVESTIGATION 9** Construct a model of the human breathing system. Explain the limitations of the model. Demonstrate that expired air contains carbon dioxide.	**INVESTI GATION 10** Measure and compare the depth of breathin g of two or more learners and the effect of exercise on breathin g/pulse rate. Interpret data on depth and rate of breathin g.	**INVESTIGATION 11:** 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.			**INVESTIGATIO N 12:** Determine the size of a population by quadrant or simple sampling e.g.simulated mark/recapture. Collect and record data Interpret data Calculate/esti mate the population size.			
Informal Tests				**Informal Test 5**			**Informal Test 6**				
SBA Formal Assessm ent	**TASK 5: Practical (minimum mark = 30 marks)** **TASK 6: Formal Test (minimum mark = 50 marks)**										
Date complete d											

ANNUAL TEACHING PLAN: LIFE SCIENCES: GRADE 11 **TERM 4: 13 October – 10 December 2025**

TERM 4 (43 days)	**Week 1** **13 - 17 October 2025** (5 days)	**Week 2** **20 – 24 October 2025** (5 days)	**Week 3** **27 – 31 October 2025** (5 days)	**Week 4** **03 - 07 Nov 2025** (5 days)	**Week 5 – 9** **10 Nov – 10 December 2025** (23 days)
CAPS Topics	**HUMAN IMPACT ON THE ENVIRONMENT** (CAPS p 51)				
Core Concepts, Skills and Values	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.	**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. *Eichomia* **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 fertilisers; -Alien plants and reduction of agricultural land; -The loss of wild varieties: impact on gene pools; -Genetically engineered foods; -Wastage.	**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*. **Solid Waste Disposal** -Managing dumpsites for rehabilitation and prevention of soil and water pollution; -The need for recycling; -Using methane from dumpsites for domestic use: heating and lighting; and -Safe disposal of nuclear waste	**FINAL EXAMINATION (Two papers)** **PAPER 1** **Marks: 150** **Time: 2 ½ hours** **Topics and marks:** *Photosynthesis – 32* *Animal nutrition – 32* *Respiration – 22* *Gaseous exchange – 32* *Excretion - 32* **PAPER 2** **Marks: 150** **Time: 2 ½ hours** **Topics and marks:** *Biodiversity and classification of micro-organisms – 29* *Biodiversity in plants and reproduction – 29* *Biodiversity in animals – 18* *Population Ecology – 37* *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% **End-of-year examinations Weighting: 60%**	
Pre-Knowledge	ECOSYSTEMS GR 10				
Daily activities	**Activity 39** Carbon footprint and pollution **Activity 40** Atmosphere and climate change	**Activity 41** Water availability **Activity 42** Water quality **Activity 43** Food security	**Activity 44** Case study on Rhino poaching and suggestions on how it can be prevented **Activity 45** Pollution and recycling		
Investigations/ Experiments	**INVESTIGATION 13:** 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.				
Inform Tests					
SBA	**40%**				
Date completed					

60%