PROVINCE OF THE

EASTERN CAPE

EDUCATION

DIRECTORATE:

FET CURRICULUM FET PROGRAMMES

LESSON PLANS

TERM 3

LIFE SCIENCES

GRADE 10

FOREWORD

The following Grade 10, 11 and 12 Lesson Plans were developed by Subject Advisors during May 2009. Teachers are requested to look at them, modify them where necessary to suit their contexts and resources. It must be remembered that Lesson Plans are working documents, and any comments to improve the lesson plans in this document will be appreciated. Teachers are urged to use this document with the following departmental policy documents: Subject Statement; LPG 2008; SAG 2008 and Provincial CASS Policy / Guidelines.

Lesson planning is the duty of each and every individual teacher but it helps when teachers sometimes plan together as a group. This interaction not only helps teachers to understand how to apply the Learning Outcomes (LOs) and Assessment Standards (ASs) but also builds up the confidence of the teachers in handling the content using new teaching strategies.

It must please be noted that in order to help teachers who teach across grades and subjects, an attempt has been made to **standardise lesson plan templates** and thus the new template might not resemble the templates used in each subject during the NCS training. However, all the essential elements of a lesson plan have been retained. This change has been made to assist teachers and lighten their administrative load.

Please note that these lesson plans are to be used only as a guide to complete the requirements of the Curriculum Statements and the work schedules and teachers are encouraged to develop their own learner activities to supplement and /or substitute some of the activities given here (depending on the school environment, number and type of learners in your class, the resources available to your learners, etc).

Do not forget to build in the tasks for the Programme of Assessment into your Lesson Plans.

Strengthen your efforts by supporting each other in clusters and share ideas. Good Luck with your endeavours to improve Teaching, Learning and Assessment.

SUBJECT: LIFE SCIENCES GRADE: 10 LESSON PLAN 1 TERM 3 TIME: 20hrs

Focus Learning Outcome/s:	LO2 AS 1, 2 & 3
Integrated Life Sciences LOs and ASs:	LO1# AS1, AS2, AS3, LO2# AS1,AS2,AS3 and LO3# AS1, AS2, AS3
Possible integration with other subjects	Physical Sciences, English, Agricultural Sciences
Knowledge Area	Life at the Molecular, Cellular and Tissues Level
Prior Knowledge	Cell Structure and Function
Topic	Cells. The Basic Unit of Life
Links to next lesson	Energy Transformation sustain Life

LEARNING OUTCOME 1: Scientific Inquiry & Problem solving Skills.		**LEARNING OUTCOME 2:** Constructs & Application of Life Sciences Knowledge.		**LEARNING OUTCOME 3:** Life Sciences and its relationships to Technology, Society and the Environment.	
AS1: Learner identifies and questions phenomena and plans an investigation	√	*AS1: Learner accesses knowledge*	√	*AS1: Learner explores & evaluates scientific ideas of past and present cultures*	√
AS2: Learner conducts an investigation by collecting and manipulating data	√	*AS2: Learner interprets and makes meaning of knowledge*	√	*AS2: Learner compares & evaluates uses and developments of resources and their products & their impact on the environment & society.*	√
AS3: Learners analyses, synthesizes, evaluates data and communicates findings	√	*AS3: Learner shows understanding of how Life Sciences knowledge is applied in everyday life*	√	*AS3: Learner compares the influence of different beliefs, attitudes and values on scientific knowledge*	√

TEACHING ACTIVITIES	**LEARNERS ACTIVITIES**	**RESOURCES**	**ASSESSMENT**	**DATE COMPLETED**
Activity 1: Transport/ movement across membranes: LO1# AS1, AS2 LO2# AS 1, AS 2 Ask learners about their understanding of the processes diffusion, osmosis and active transport. Consolidates discussions. Demonstrates and explains how the processes of diffusion, osmosis and active transport take place by means of experimentation e.g. • **Diffusion**: Teacher hands out worksheets with instructions. • He can also splash ether/ or spray DOOM on the	Respond to questions and come up with explanation of terms. **Practical Investigation**: Learner groups measure the rate of diffusion of potassium permanganate crystals in two different solutions (water and a sugar solution), or may measure the rate various chemicals take to dissolve in different types of	Test tubes, chemicals, liquids, worksheet, workbook, stopwatch, etc.	Formal assessment: Memorandum	

blackboard to illustrate the speed of gaseous diffusion to the learners.	liquids. Individual reporting of experiment.			
TEACHING ACTIVITIES	**LEARNERS ACTIVITIES**	**RESOURCES**	**ASSESSMENT**	**DATE COMPLETED**
• **Osmosis**: Teachers demonstrates the setup of the apparatus and the investigation procedure. Teacher explains the following terminology i.e. non-permeable, differentially permeable (semi) and fully permeability, solutions, concentrations Teacher instructs the learners to do the practical investigation as on the worksheet	Learners observe and make notes. **Practical investigation:** Learners investigate the direction of water movement between two different solutions separated by means of a differentially permeable membrane (e.g. egg membrane, potato, dialysis tubing or a frog skin). Individual reporting of experiment	Retort stand & clamps, cotton/ string, water, sugar, egg membrane, rubber bands, spatula/ teaspoon, 2 beakers, thistle funnel & spatula	Formal assessment: Memorandum	
• **Active Transport:** Teacher explains active transport highlighting important terminology i.e. **concentration gradient** and **energy dependency** by means of examples. Teachers instructs the learners to construct a table illustrating the properties of the different processes above	Learners observe and make notes. Learners tabulate the properties of the different processes i.e. diffusion, osmosis and active transport	Workbooks	Informal assessment : Question & Answer (Q & A) Informal Assessment: Test	
Activity 2: Cell division – mitosis: LO 1# AS2 & AS3, LO2# AS1, AS2, LO3# AS1, AS3 Use suitable resources to explain the cell cycle. Teacher explains the importance of mitosis, the process, as well as the structure of a chromosome.	Learners observe and make summary notes	Textbook drawings, transparencies, models, posters or wall charts.	Informal Assessment: Q & A	
Teacher instruct the learners to do the following: • A practical investigation • Construction of models with playing dough/ clay	• Practical investigation: Learners observe the tip of an onion and make drawings of the various division stages using a microscope (if available) or/ • Learners construct models of the various division stages from illustrations using	Microscope, onion root & slides Playing dough, clay, textbooks	Informal Assessment: Memorandum of drawing/ rubric & feedback	

	colour playing dough/ clay.			
Teacher advises the learners to gather additional info about this important life process.	Learners summarize the importance of mitosis on all life processes in a paragraph in their workbooks.	Workbooks	Self / Peer assessment	
TEACHING ACTIVITIES	**LEARNERS ACTIVITIES**	**RESOURCES**	**ASSESSMENT**	**DATE COMPLETED**
Teachers give summary on all types of known cancers found e.g. leukemia, breast, lung & prostrate	Learners make summary notes.	Workbooks	Informal Assessment: Q & A	
Instructs that each learner group do research on ONE cancer found in the local or provincial communities. (Groups investigate different cancers)	The learners gather information through interviews and reading. They focus on the causes, prevalence and treatment of the investigated cancer in their presentation their peers	Traditional healers, doctors, nurses, old and new treatment technologies, internet, workbooks	Peer assessment	
Facilitates the class discussion on the beliefs & attitudes of the community concerning the cancers, based on the research findings and consolidates the findings**.**	The learners discuss and highlighting the views of traditional healers and modern biotechnology i.e. radiotherapy & chemotherapy were possible.	The above research findings	Peer assessment	
Activity 3: Plant and Animal Tissues: LO1# AS1, AS2, AS3, LO2# AS1, AS2, AS3, LO3# AS1, AS2, AS3 Teacher defines the concept of a tissue.	Learners make summary notes.	Workbooks	Informal: Q & A	
Explains the different types of plant tissues and focuses on structure and function(s) using drawings	The learners tabulate the various tissues i.e. tissue group, tissue type, structural drawing and function(s).	Workbooks, textbooks, posters, wall charts	Informal: Class Test	
Explains the different types of animal tissues and focuses on structure and function(s) using drawings	The learners tabulate the various tissues i.e. tissue group, tissue type, structural drawing and function(s)	Workbooks, textbooks	Informal: Class Test	

The teacher facilitates these activities, helping learners with the identification.	**Actualization of content:** • Utilizing a microscope and various slides the learner consolidates the new content or/ • The learner identifies different tissue types as illustrated on a worksheet/ transparency or/ • Identify and examine some plant and animal tissues using bio-strips with bio-viewer, micrographs • or watching a video.	Microscopes, slides, textbooks, transparencies, internet drawings, worksheet, bio-viewer with stripes, video micrographs, workbooks.	Informal: Memorandum Peer	
TEACHING ACTIVITIES	**LEARNERS ACTIVITIES**	**RESOURCES**	**ASSESSMENT**	**DATE COMPLETED**
Teacher instructs the learners to do an investigation on biotechnology utilizing ONE of the plant or animal tissues e.g. cloning, stem-cell research.	The learner investigates and collects information on ONE field of biotechnology, relating to plant and animal tissues and summarizes his/her findings on a **poster**. The learner should focus on the ethics and legislation aspects of this research.	Textbooks, internet, biotechnology companies, brochures & pamphlets, newspaper articles, University staff and departmental officials, traditional healers	Informal: Peer using Rubric	
Teacher can also invite a knowledgeable speaker to give learners information on possible career opportunities in biotechnology.	Learners take notes and ask questions	As above	Informal: Q & A	
Teacher can also invite a traditional healer to give learners information on the use of traditional medicines by referring to indigenous plants.	Learners take notes and ask questions	As above	Informal: Q & A	
Activity 4: Organs: LO1# AS1, LO2# AS2, AS3 The Teacher defines an organ and a system using a leaf	Learners take notes and ask questions	Workbook, Leaves	Informal: Q & A	
He also emphasizes the principles of a correct biological	The learner makes a cross-section drawing of	Workbook,	Memorandum of	

drawing.	a dicotyledonous leaf to illustrate the various tissues present in an organ (leaf).	textbook	a drawing and peer assessment	
The teacher facilitates this activity and ensures that the learners correctly identify the tissue and its function	The Learners using drawings from prepared microscope slides/ micrograph, poster or textbook illustration to explain the tissue structures in terms of its function in the organ (leaf) i.e. photosynthesis, gaseous exchange and transport to his peers.	Textbook, poster, reference books, micrographs, microscope and slides	Informal Q & A	
Teacher facilitates the links of the plant tissues, appropriate cell organelles, movement across membranes and movement of molecules into, through and out of the leaf by using a transparensy.	Learners use mind map/ flowchart to illustrate the various movements on a worksheet	Transparency with arrows or/ worksheet with illustration	Informal: Controlled Test	
Homework: The learners are tasked to make a daily glossary of new biological terms used throughout this lesson				
Enrichment/Expanded Opportunities: Additional informative articles				
Teacher Reflections:				

SIGNATURES:

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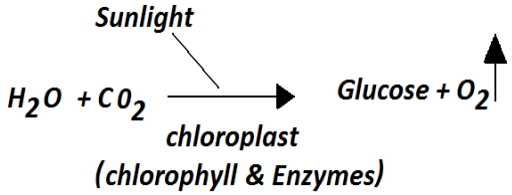
TEACHER DATE HOD / SMT DATE

SUBJECT: LIFE SCIENCES GRADE: 10 LESSON PLAN 2 TERM 3 TIME: 16hrs

Focus Learning Outcome/s:	LO2 AS 1, 2 & 3
Integrated Life Sciences LOs and ASs:	LO1# AS1, AS2, AS3, LO2# AS1, AS2, AS3, LO3# AS1, AS2, AS3
Possible integration with other subjects	Agricultural Sciences, Mathematics, English
Knowledge Area	Life Processes in Plants and Animals
Prior Knowledge	Cells: The Basic unit of Life
Topic	Energy Transformation to sustain Life
Links to next lesson	Energy Transformation to sustain Life (continue)

LEARNING OUTCOME 1: Scientific Inquiry & problem Solving Skills.		**LEARNING OUTCOME 2:** Constructs & Application of Life Sciences Knowledge.		**LEARNING OUTCOME 3:** Life Sciences and its relationships to Technology, Society and the Environment.	
AS1: Learner identifies and questions phenomena and plans an investigation	√	AS1: Learner accesses knowledge	√	AS1: Learner explores & evaluates scientific ideas of past and present cultures	√
AS2: Learner conducts an investigation by collecting and manipulating data	√	AS2: Learner interprets and makes meaning of knowledge	√	AS2: Learner compares & evaluates uses and developments of resources and their products & their impact on the environment & society.	√
AS3: Learners analyses, synthesizes, evaluates data and communicates findings	√	AS3: Learner shows understanding of how Life Sciences knowledge is applied in everyday life	√	AS3: Learner compares the influence of different beliefs, attitudes and values on scientific knowledge	√

TEACHER ACTIVITIES	**LEARNER ACTIVITIES**	**RESOURCES**	**ASSESSMENT**	**DATE COMPLETED**
Activity 1: Photosynthesis: LO1# AS2, AS3, LO2# AS1, AS2, AS3, LO3# AS2, AS3 Teacher defines and gives a description of the process in words and equation. He refers to the intake of raw materials, trapping and storing of energy, formation of food in the chloroplasts and its storage.	Learners take down equation and write descriptive notes  	Workbook, textbooks	Informal : Q &A	

TEACHER ACTIVITIES	LEARNER ACTIVITIES	RESOURCES	ASSESSMENT	DATE COMPLETED
Teacher hands out worksheets with instructions on the two practical investigations: • The production of starch during photosynthesis • Light is an essential for the process of photosynthesis.	**Practical investigations**: • Learner groups investigate the production of starch during photosynthesis (doing the iodine test). • Learner groups investigate the role of light in the process of photosynthesis by isolating sections on the leave with aluminum foil. Learners hand in a scientific write-up of the experiments	Worksheets, leaves, iodine, beaker, Petri-dish, aluminum foil, test tube etc.	Formal: Rubric or/ memorandum	
Teacher hands out worksheets and demonstrates the following three factors to the learners by means of experimentation. • Carbon dioxide is necessary for photosynthesis • Chlorophyll is necessary for photosynthesis • Photosynthesis gives off oxygen	• Learners observe and complete the worksheets. • Learners hand in a scientific write-up of the experiments	Apparatus, worksheets, workbooks	Informal	
Teacher explains the concept **rate of photosynthesis**. Utilizing a transparency and hand-outs he facilitates the discussion.	Looking at the graphs on the transparency and on the handouts the learners discuss and summarize • the effects of variable amount of light, • carbon dioxide, and • temperature on the rate of photosynthesis.	Graphs, transparencies, handouts, Workbooks	Informal : Class Test	
The teacher hands out a table of raw data temperature and instructs the learners to draw a graph and calculate the rate of photosynthesis	The learners plot a graph and calculate the rate of photosynthesis	Graph paper	Informal Assessment: Rubric	
The teacher provides a text extract/ newspaper articles for the learners to read.	The learners read and debate the role of carbon dioxide enrichment, optimum light exposure and temperatures in greenhouses.	Newspaper clippings or extract	Informal: Q & A	

TEACHER ACTIVITIES	LEARNER ACTIVITIES	RESOURCES	ASSESSMENT	DATE COMPLETED
The teacher explains the concept of **deforestation**, listing the benefits and consequences of this agricultural practice.	Learners listen and take notes. The learner summarizes the consequences of large scale removal of vegetation in a essay	Reference books, textbooks, internet articles	Informal: Q & A Rubric	
Activity 2: Animal Nutrition: LO1# AS1, AS2 LO2# AS2, AS3, LO3# AS2, AS3 Teacher introduces the concept of **Balanced diet** by comparing food intake vs. energy growth and health requirements. He tasks the learners to investigate different dietary information on three different cereal packing and design a balanced diet.	Learners interpret dietary information on the packing and design a balanced diet plan to present to their peers.	Cereal Packing, textbook	Informal Assessment: Peers, Rubric, Q & A (select a few individuals)	
Teacher introduce the topics and facilitates the group discussion	Learner groups discuss how age, sex and activities can change its demands on a balanced diet.	Above findings	Informal Assessment: Peers, Rubric, Q & A (select a few individuals.)	
Teacher introduces the concept of **malnutrition** with examples. He hands out newspaper clippings/ text extracts for learners to read. Teacher shows a video/ news extract (if available).	Learners listen and take notes. The learners read and do a data analysis of magnitude of people suffering from malnutrition. Watch the video.	Newspaper clippings, reference books, extracts, video, internet articles	Informal : Class Test	
Teacher tasks the learners to do a summary on the.	They discuss and tabulate their summary in their workbooks the reasons **for** and the **effects** of nutritional disorders (malnutrition) with respect to: • unbalanced diets (e.g. kwashiorkor)	reference books, textbooks, newspaper extracts, internet articles	Informal: Rubric	

	• starvation (marasmus & anorexia) • coronary heart disease, • Diabetes & Obesity			
TEACHER ACTIVITIES	**LEARNER ACTIVITIES**	**RESOURCES**	**ASSESSMENT**	**DATE COMPLETED**
Teacher distributes relevant articles and identifies individuals beforehand to briefly share with the rest of the class the information on different diets. He summarizes the complexity and differences of human preferences	The learners read the **Case study** and briefly discuss the different diets e.g. Cultural, religious, personal and health choices of diet, e.g. lacto-vegetarian, vegetarian, halaal and kosher. Learners listen and take notes.	Newspaper clippings, reference books, extracts, video, internet articles, work books	Informal Assessment on group participation	
Activity 3: Processes of Nutrition: LO2# AS1, AS2 Teacher introduces and highlights the significance of the following processes: **Ingestion, Digestion, Absorption, Assimilation and Egestion.**	The learner groups discuss and summarize each processes involved during nutrition in their workbooks	Teacher, workbooks	Informal: Q & A.	
Teacher introduces and defines the following nutritional lifestyles with examples**: Producers (Autotrophs)** and **Consumers (Hetrotrophs), Herbivores, Carnivores** and **Omnivores**.	Learners listen and take notes Learners revisit the characteristics of an ecological pyramid. After a group discussion identify the logical place where each of the nutritional lifestyles could be found.	Workbooks, Textbooks	Informal: Q & A.	
Activity 4: Human nutrition: LO2# AS1, AS2, AS3 Teacher tasks the learners to complete the worksheet using their textbooks and other reference materials	Identify the **macrostructures** of the human digestive system with its alimentary canal and the associated organs as illustrated on the worksheet. The functions of the different parts/ organs contributing towards nutrition must also be defined.	Textbooks, reference books, worksheet, OHP or labeled drawing	Transparency of digestive system with correct labels	
Teacher tasks and assesses the learners in the completion of the table.	The learners construct a table with the headings: Ingestion, Digestion, Absorption,	Textbooks,	Memorandum of table	

	Assimilation and Egestion. They use this table to compare the various nutritional lifestyles, different anatomical structures and energy relationships.	reference books		
TEACHER ACTIVITIES	**LEARNER ACTIVITIES**	**RESOURCES**	**ASSESSMENT**	**DATE COMPLETED**
Teacher compiles a controlled test to assess the knowledge of the learners on work done in term 3.	Write controlled test in their workbooks**.**		**Formal Assessment: Controlled Test** **100 Marks 1hour**	
Homework: The learners are tasked to make a daily glossary of new biological terms used throughout this lesson				
Enrichment/Expanded Opportunities: Additional informative articles				
Teacher Reflections:				

SIGNATURES:

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TEACHER DATE HOD / SMT DATE