PROVINCE OF THE

EASTERN CAPE

EDUCATION

DIRECTORATE:

FET CURRICULUM FET PROGRAMMES

LESSON PLANS

TERM 3

LIFE SCIENCES

GRADE 12

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; Examination Guidelines 2009 and Provincial CASS Policy / Guidelines. **Educators are reminded that these lesson plans can be used only up to 2010. In 2011 the new content framework will be used to develop lesson plans.**

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: 12 LESSON PLAN 1 TERM 3 TIME: 8Hrs	
Focus Learning Outcome/s:	LO 2 AS 1, 2 & 3
Integrated Life Sciences LOs and ASs:	LO 1 AS 1, 2 & 3
Possible integration with other subjects	ENGLISH, MATHEMATICS
Knowledge Area	Biodiversity, Change and Continuity
Prior Knowledge	Genetics, Meiosis
Topic/s	Early Theories of Evolution and Explanation of Evolution in Terms of Current Knowledge
Links to next lesson	Evidence of Evolution

LEARNING OUTCOME 1: Scientific Inquiry & problem Solving Skills		**LEARNING OUTCOME 2:** Construction & Application of Life Sciences Knowledge		**LEARNING OUTCOME 3:** Life Sciences and its relationship 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 and evaluates uses & development of resources and their products & their impact on the environment & society.	
AS3: Learner 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: INTRODUCTION LO 2 AS 2 & 3 Introduces evolution by reviewing the nature of science, comparing scientific theory with theory in general. Explains science concepts like: fact, hypothesis,	Listen and take notes. Respond to questions, discuss and give their views about the new topic.		Informal Teacher Oral questions	

models, etc. Explains diversity and extinction in terms of evolution. Involves learners through questions and discussions. Consolidation of learners' discussion and correcting any misconceptions.				
ACTIVITY 2: EARLY THEORIES OF EVOLUTION (a) Lamarck's Theory LO 2 AS 1 & 2 LO 1 AS 1, 2 & 3 Describes the two laws of Jean Baptiste de Lamarck. Relate the two laws to their knowledge of genetics and ask probing questions to allow learners to criticize these theories. Consolidates the discussions and shows why these "laws" could not be accepted by most scientists.	Listen and take notes. Respond to questions, debate / criticize the validity of these theories.			
(b) Darwin's Theory Introduces Charles Darwin and describe his theory of evolution by natural selection Describes Darwin's theory in terms of the historical development and observations on which he based it. Provides learners in groups with different case studies on natural selection and allows each group to read, discuss and report about the case study allocated. Consolidates the reports. Asks learners to conduct a practical activity to show variation of species using seeds of the same plant	Listen and take notes. In groups learners read, discuss,analyze and report to the class about the allocated case study. Conduct practical activity and do observations as the seedlings grow.	Case Study	Practical	

observing the seedlings as they grow. Invites learners to criticize Darwin's theory. Involves learners in outlining the differences between Lamarck's and Darwin's theories.	Give their views and criticize Darwin's theory. Outline the differences between Lamarck and Darwin's theories.		Investigation Teacher Rubric	
TEACHER ACTIVITIES	**LEARNER ACTIVITIES**	**RESOURCES**	**ASSESSMENT**	**DATE COMPLETED**
ACTIVITY 3: EXPLANATION OF EVOLUTION IN TERMS OF CURRENT KNOWLEDGE LO2 AS 1, 2 & 3 Asks learners about their understanding of the following terms: Phenotype, Genotype, Meiosis, Mutation, Reproduction, and Variation. Consolidates learners' responses. Explains how current knowledge of evolution supports Darwin's ideas starting from Darwin's observations of variation of offspring: • Phenotypic variation as a result of genetic variation • Role of meiosis, mutation and reproduction in variation. • Inbreeding and outbreeding (one human and one non-human examples) • Micro-evolution, speciation and macro-evolution using examples. Gives learners a classwork Asks learners to compile a glossary of new terms.	Respond to questions asked. Listen and take notes and questions for clarity. Do classwork exercise in their books. Compile the glossary of terms	Charts Pictures Textbooks	**Informal:** Classwork Teacher Peer Memorandum	

TEACHER ACTIVITIES	LEARNER ACTIVITIES	RESOURCES	ASSESSMENT	DATE COMPLETED
ACTIVITY 4: THE GEOLOGICAL TIME SCALE LO 2 AS 1 & 2 Describes the geological time scale in terms of: • The need for the geological time scale • The structure of the geological time scale • The three eras: Paleozoic, Mesozoic and Coenozoic • Periods of the eras • Major events in each era of each of the geological time scale. Gives learners a classwork	Listen and take notes Do classwork exercise in their books.	Textbooks Handouts	**Informal:** Classwork Teacher Memorandum	
Homework:				
Enrichment/Expanded Opportunities:				
Teacher Reflections:				

SIGNATURES:

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TEACHER DATE HOD / SMT DATE

SUBJECT: LIFE SCIENCES GRADE: 12 LESSON PLAN 2 TERM 3 TIME: 4 Hrs	
Focus Learning Outcome/s:	LO 2 AS 1, 2 & 3
Integrated Life Sciences LOs and ASs:	LO 3 AS 1
Possible integration with other subjects	ENGLISH, MATHEMATICS
Knowledge Area	Biodiversity, Change and Continuity
Prior Knowledge	Explanation of evolution in terms of current knowledge
Topic/s	Biological Evidence of Evolution of Populations
Links to next lesson	Popular Theories of Mass Extinction

LEARNING OUTCOME 1: Scientific Inquiry & problem Solving Skills		**LEARNING OUTCOME 2:** Construction & Application of Life Sciences Knowledge		**LEARNING OUTCOME 3:** Life Sciences and its relationship 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 and evaluates uses & development of resources and their products & their impact on the environment & society.	
AS3: Learner 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: INTRODUCTION LO: 2 AS 1 & 2 Introduces and explains different fields which contributed to acceptance of the theory of evolution, viz. • Paleontology	Listen and take notes	Library books	Informal:	

• Comparative Embryology • Comparative Anatomy • Comparative Biochemistry & • Biogeography Refers learners to libraries/ internet to get more information about the different fields and make summaries	Search for information from libraries / internet about the different fields and make summaries	Internet Handouts Textbooks	summaries Teacher Rubric	
ACTIVITY 2: PALEONTOLOGY LO 2 AS 1 & 2 LO 3 AS 1 Direct Teaching: • Explains what fossils are, how they are formed and the role they play in understanding ancient life • Explains how interpretation of fossil records helps to develop patterns of development amongst species through the observation of homologous and analogous structures. • Explains radiometric dating and relative dating as methods of finding out the age of fossils. • Mention the use of the fossils in determining the age of the earth, the complexity of life forms today compared to those that existed in the past. Organise a visit to a museum and draw up a worksheet to be used for data collection/gathering. Or Invite a paleontologist to the school to present on how fossils are formed and dated. Consolidation of information gathered by learners	Listen and take notes Observe and record what they see in the museum as guided by the worksheet and the paleontologist Listen, take notes and interact with the paleontologist.	Museum Paleontologist Worksheet Fossils Charts Powerpoint Presentation Over Head Projector (OHP) OHP Transparencies		

TEACHER ACTIVITIES	LEARNER ACTIVITIES	RESOURCES	ASSESSMENT	DATE COMPLETED
ACTIVITY 3: COMPARATIVE EMBROYOLOGY, ANATOMY & BIOCHEMISTRY LO 2 AS 1 & 2 Explains what is meant by: • Comparative embryology, anatomy and biochemistry • Provides learners with diagrams to compare the embryos of vertebrates to show similarities • Provides learners with diagrams to compare homologous and analogous structures among organisms to show similarities and differences Lists the features that will show possible common origin of different organisms e.g. identical DNA structure, etc.	Listen and take notes Interact with the given diagrams and identify similarities and differences Listen, take notes	Diagrams Charts Textbooks OHP Transparencies Micrographs		
ACTIVITY 4: BIOGEOGRAPHY LO 2 AS 2 Asks questions to briefly review biomes of South Africa and those of the world. Consolidates ideas of learners. States that different but closely related species in similar biomes across the world have similar features in adapting to that biome, indicating that they probably developed from a common ancestral species	Respond to the questions. Listen and take notes			
Homework:				

Enrichment/Expanded Opportunities:
Teacher Reflections:

SIGNATURES:

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TEACHER	DATE	HOD / SMT	DATE

SUBJECT: LIFE SCIENCES GRADE: 12 LESSON PLAN 3 TERM 3 TIME: 2 Hrs	
Focus Learning Outcome/s:	LO 2 AS 1, 2 & 3
Integrated Life Sciences LOs and ASs:	
Possible integration with other subjects	ENGLISH, MATHEMATICS
Knowledge Area	Biodiversity, Change and Continuity
Prior Knowledge	Biological Evidence of Evolution of Populations
Topic/s	Popular Theories of Mass Extinction
Links to next lesson	Human Origins

LEARNING OUTCOME 1: Scientific Inquiry & problem Solving Skills		**LEARNING OUTCOME 2:** Construction & Application of Life Sciences Knowledge		**LEARNING OUTCOME 3:** Life Sciences and its relationship 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 and evaluates uses & development of resources and their products & their impact on the environment & society.	
AS3: Learner 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: Mass Extinctions LO: 2 AS 1 , 2 & 3 Explains what is meant by mass extinction.	Listen and take notes	Charts Powerpoint Presentation	Informal :	

Discusses the contribution of: • Earthly theories of Mass Extinctions , viz. Ice Ages, Continental Drift, Plate Tectonics, Volcanic Activities and Diseases • Extraterrestrial Theories			Classwork Teacher Memorandum	
Homework:				
Enrichment/Expanded Opportunities:				
Teacher Reflections:				

SIGNATURES:

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TEACHER DATE HOD / SMT DATE

SUBJECT: LIFE SCIENCES GRADE: 12 LESSON PLAN 4 TERM 3 TIME: 2 Hrs	
Focus Learning Outcome/s:	LO 2 AS 1, 2 & 3
Integrated Life Sciences LOs and ASs:	LO 3 AS 1, 2 & 3
Possible integration with other subjects	ENGLISH, MATHEMATICS, HISTORY
Knowledge Area	Biodiversity, Change and Continuity
Prior Knowledge	Classification of organisms
Topic/s	**Human Origins**
Links to next lesson	**Revision for end of year examinations**

LEARNING OUTCOME 1: Scientific Inquiry & problem Solving Skills		**LEARNING OUTCOME 2:** Construction & Application of Life Sciences Knowledge		**LEARNING OUTCOME 3:** Life Sciences and its relationship 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 and evaluates uses & development of resources and their products & their impact on the environment & society.	✓
AS3: Learner 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: INTRODUCTION LO 2 AS 1 & 2 Review classification of the animal kingdom by asking questions based on what the learners learnt in previous grades. Consolidates. Interprets a phylogenetic tree to show the place of the	Respond to questions and take down summary. Listen, take notes and draw a phylogenetic tree	Chart Textbooks	Informal: Checklist	

family Hominidae in the animal kingdom				
TEACHER ACTIVITIES	**LEARNER ACTIVITIES**	**RESOURCES**	**ASSESSMENT**	**DATE COMPLETED**
ACTIVITY 2: CHARACTERISTICS OF HUMANS AND THOSE OF OTHER PRIMATES LO 2 AS 1 & 2 Provides learners with diagrams or charts of primates including humans. Asks the learners to identify from the diagrams or charts the characteristics that humans share with other primates and those that make them different. Consolidates and add those characteristics that cannot be identified from the diagrams or charts.	Using the diagrams or charts the learners identify the characteristics that humans share with other primates and those that make them different.	Diagrams or charts Powerpoint presentation OHP Transparencies	**Informal** Classwork Teacher/Peer/Self Memorandum	
ACTIVITY 3: TRENDS IN HUMAN EVOLUTION LO 2 AS 1, 2 & 3 With the aid of charts the teacher describes the changes in structure (features) that characterize human evolution, viz. • Shift of foramen magnum to a more forward position • A more rounded skull and increased cranium size • A flatter face	Listen and take notes		**Informal** Homework Teacher/Peer/Self Memorandum	
Provides learners in groups with a worksheet to trace the progressive evolution of the above features in the organisms listed below: • Ape-like beings • First apes on the same line of development as humans	In groups learners trace the progressive evolution using worksheets and charts.	Textbooks Charts Handouts	**PoA Task** **Assignment 2** **Teacher**	

• First bipedal primates • Australopithecines • *Homo habilis* • *Homo erectus* • *Homo sapiens* Consolidates and corrects any misconceptions. OR Direct Teaching of the above	Listen and take notes	Worksheet Powerpoint presentation OHP Transparencies	**Memorandum**	
TEACHER ACTIVITIES	**LEARNER ACTIVITIES**	**RESOURCES**	**ASSESSMENT**	**DATE COMPLETED**
ACTIVITY 4: SEARCH FOR THE CRADLE OF HUMANKIND LO 2 AS 1, 2 & 3; LO 3 AS 2 & 3 Explains differences between anthropology, paleontology and archaeology. Explains how the fields of study mentioned above are used to search for the cradle of the humankind. Using a flow chart or diagrams, the teacher traces the search for the cradle of humankind from South Africa to East Africa then to Central Africa in the light of fossil evidence. Asks learners to discuss in pairs and mention reasons for population movements. Consolidates and briefly explains the following reasons for population movements:	Listen and take notes Listen and ask questions for clarity. Discuss in pairs and report back. Listen, take notes and ask questions for	OHP transparencies Charts Textbooks	Informal: Classwork Self/Peer Memorandum	

Maldistribution of resources and inefficient use of natural resources; Environmental resistance; Poverty and hunger	clarity			
TEACHER ACTIVITIES	**LEARNER ACTIVITIES**	**RESOURCES**	**ASSESSMENT**	**DATE COMPLETED**
ACTIVITY 5: Alternatives to the evolutionary theory of diversity LO 3 AS 3 Supplies learners with relevant resources. Initiates a discussion on arguments against evolution such as: • Age of the earth • The probability of forming organic molecules by chance • The tendency towards disorderliness • Gaps in the fossil record	Group / class discussion on arguments against evolution	Textbooks Handouts Powerpoint presentation	Informal: Checklist Rubric Teacher Group	
ACTIVITY 6: REVISION ON ALL WORK DONE FROM THE BEGINNING OF THE YEAR				
ACTIVITY 7: TRIAL EXAMINATIONS				
Homework:				

Enrichment/Expanded Opportunities:
Teacher Reflections:

SIGNATURES:

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TEACHER	DATE	HOD / SMT	DATE