education

Department of Education
REPUBLIC OF SOUTH AFRICA

NATIONAL CURRICULUM STATEMENT GRADES 10-12

SUBJECT:

LIFE SCIENCES

TEACHER TRAINING MANUAL 2006

CONTENTS

PERIOD: **Monday to Friday**

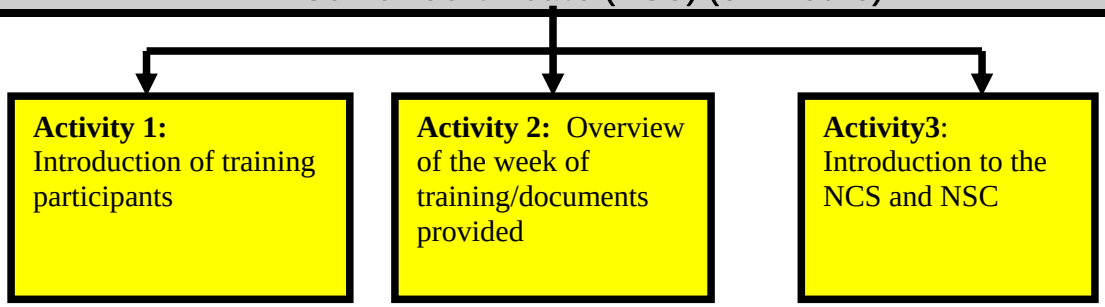
DURATION: **36-37 hours**

5-DAY PROGRAMME FOR TEACHERS-

SESSION	ACTIVITY	TIME	PRESENTER
1. Introducing the National Curriculum Statement (NCS) and the National Senior Certificate (NSC)	**DAY 1**		
	Introduction of training participants	15 min	
	Overview of the week of training / documents provided	30 min	
	Introduction to the NCS and NSC	3 hrs	
2. Introducing the Subject Statement	**DAY 1, 2 & 3**		
	Introduction to Life Sciences	2 hours	
	Learning Outcomes, Subject Content and Approach		
	Part 1 – Outcomes & Content in Life Sciences.	Part 1- 3 Hrs	
	Part 2 – Integration across the Learning Outcomes	Part 2 – 2 Hrs	
	Part 3 – Subject Approach	Part 3 – 1 ½ Hrs	
	Skills in Life Sciences' Outcomes	2 hours	
	Indigenous Knowledge in the Life Sciences	2 hours	
3. Planning for teaching subjects in the NCS	**DAY 4**		
	Introduction to the Planning Cycle	0.5 hours	
	The Grade 11 Work Schedule	1 hour	
	Critique of the Grade 11 Work Schedule	2 hours	
	Development of the Lesson Plan for Grade 11	4.5 hour	
4. Annual assessment plan	**DAY 5**		
	Introduction to Assessment in the NCS	1hours	
	Assessment of Life Sciences for Grades 10-12	2 hours	
	Development of a Grade 11 Annual Assessment Plan	2 hours	

SESSION 1 –

Introducing the National Curriculum Statement (NCS) and the National Senior Certificate (NSC) (3-4 hours)



1.

ACTIVITY 1: Introduction of training participants

FORM OF ACTIVITY: Introduction (Ice Breaker Organelles)

INSTRUCTIONS:

- Facilitator gives instructions for an ice breaker

2.

ACTIVITY 2: Overview of the week of training / documents provided

FORM OF ACTIVITY: Presentation

RESOURCES: The 5-day training programme (PowerPoint)
A hard copy of each document referred to-

- National Senior Certificate Policy
- Subject Statement
- Subject Assessment Guidelines
- Learning Programme Guidelines
- Teacher Guide – only applicable to Mathematical Literacy and Life Orientation
- National Protocol on Assessment
- Higher Education admission requirements

CONTENT:

2.1. Training programme for the week and house rules
2.2. Documents making up the National Curriculum Statement policy and documents supporting the National Curriculum Statement policy – purpose and status of each

INSTRUCTIONS:

- The Facilitator presents above content to participants

3.

ACTIVITY 3: Introduction to the NCS and NSC

Part 1: 20 Questions

FORM OF ACTIVITY: Test and discussion

RESOURCES: PowerPoint Presentation, Laptop, Data Projector

CONTENT:

3.1. 20 questions focusing on the NCS and NSC

INSTRUCTIONS:

- Allow the participants to record their responses to each question as individuals.
- Discuss the answers with the group as a whole, inviting participants to offer answers before discussing them

Part 2: The National Curriculum Statements (NCS) and the National Senior Certificate (NSC)

FORM OF ACTIVITY: Presentation and discussion

RESOURCES: PowerPoint Presentation, Laptop, Data Projector, a hard copy of each document referred to in the presentation-

- National Senior Certificate Policy
- Subject Statement
- Subject Assessment Guidelines
- Learning Programme Guidelines
- National Protocol on Assessment

CONTENT:

3.2. Overview of the NCS, including principles and Critical and Developmental Outcomes
3.3. National Senior Certificate: Requirements, structure and details

INSTRUCTIONS:

- The facilitator gives a power point presentation on above topics.
- Participants make comments and ask questions.

Part 3: Requirements for Higher Education study

FORM OF ACTIVITY: Open-book and presentation

RESOURCES: PowerPoint Presentation, Laptop, Data Projector, HE admission requirements

CONTENT:

3.4. Requirements for certificate, diploma and degree programmes

INSTRUCTIONS:

- The facilitator gives a power point presentation on above topics as follows:

Introduction

- While the Higher Education document is not part of NCS policy, it provides teachers with indicators on required learner performance in NCS subjects for entry into Higher Education
- The 3-year NSC programme is the key to Higher Education study and teachers need to be aware of the admission requirements for different programmes offered at Higher Education Institutions

Open-book activity

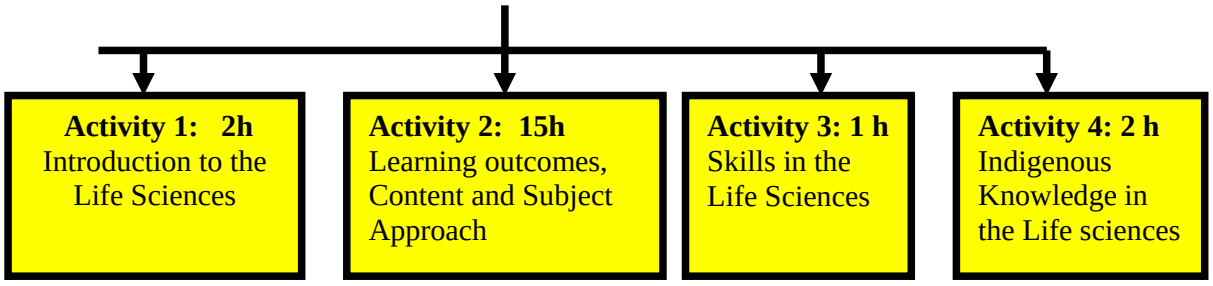
- Participants work in groups. They study the HE document and identify the requirements for certificate, diploma and degree programmes

Report back and discussion

- Groups report back
- Present the requirements (see PowerPoint Presentation)
- Discuss the designated list of subjects, noting that learners already have 3 of the designated subjects in their NSC package – two languages and Mathematics or Mathematical Literacy

SESSION 2 –

Introducing the Life Sciences Subject Statement (20 hours)



1.

ACTIVITY 1: Introduction to Life Sciences (2 hours)

FORM OF ACTIVITY: Presentation, interactive, report back and discussion

RESOURCES: PowerPoint Presentation, Laptop, Data Projector, Subject Statement, a hard copy of each supporting policy relevant to the subject:

- Religion in Education
- HIV / Aids

CONTENT:

1.1. Overview of the subject
1.2. Incremental implementation of the LIFE SCIENCES curriculum for Grades 10-12
1.3. Brief overview of subject developments - Comparing NCS and NATED 550
1.4. Time allocation

INSTRUCTION:

- Overview of the subject
  Power point presentation by facilitator as follows:
  - Definition, purpose and scope of the subject – its origin
  - Learning Outcomes for the subject – briefly refer to relationship with the Critical and Developmental Outcomes and the NCS principles

- Using power point presentation, the facilitator explains Incremental implementation of the LIFE SCIENCES curriculum for Grades 10-12 by

  - Pointing out how the Assessment Standards for LIFE SCIENCES give an indication of the teaching, learning and assessment approach to be used in the classroom – for example the verbs and the nouns contained in each Assessment Standard
  - Giving a general indication of the skills and knowledge to be displayed by learners when engaging in an activity related to that Assessment Standard

- The facilitator gives a brief overview of subject developments i.e. compares the LO's of the NCS to the aims and objectives of the NATED 550 (Report 550 to National Curriculum Statement). The groups are asked to fill in column 2 by inserting relevant Life Sciences LO's. (Refer to appendix)

- Working in groups participants compare NCS and NATED 550 by completing the table in the appendix. (Use a separate page if the space is not enough)

- The facilitator discusses the following supporting policies relevant to the subject and how they support the implementation of the LIFE SCIENCES.

Laws and Acts	Key elements
Constitution – Bill of Rights	Fundamental Rights in education: • Juristic person; • Equality; • Rights to privacy; • Freedom of association, religion, language, culture and expression; • Human dignity; • Limitation clause; • The Rights of the child; and • Rights to basic education.
National Education Policy Act (Act 27 of 1996)	A general policy meant to address a broader issues in education and training
South African Schools Act (Act 84 of 1996)	The objectives of the Act: • To provide for a uniform system for the organisation, • Governance and funding of schools; • To amend and repeal certain laws relating to schools; and • To provide for matters connected therewith.
Employment of Educators Act (Act 76 of 1998)	• Regards the employee as an educator; which includes: "any person who teaches, educates or trains other persons or provides professional therapy at any school, ..."); and • SACE. • Conditions of service
Labour Relations Act (Act 66 of 1995)	The employer-employee relation as the focus of this section.
Occupational Health and Safety Act (Act 85 of 1993)	The Act deals with the Health and Safety of persons in the workplace. It covers the use of industrial equipment and machinery, and protection against threats and the health and safety of persons in the workplace.
White Paper 6: Inclusive Education (LSEN)	Assists in the provision of educational opportunities for learners who experience barriers, to learning and development.
White Paper 7 (e–Education)	Information Technology has an impact on curriculum development and delivery in terms of access, cost effectiveness and the quality of education. It can also be integrated into the learning and teaching process.

- The facilitator discusses time allocation and placement of LIFE SCIENCES in the school timetable (Presentation) – ..\Timetabling 2.doc. Participants pose questions and comments.

2.

ACTIVITY 2: Learning Outcomes, Subject Content & Subject Approach (15 Hrs)

NOTE: Each Learning Outcome for LIFE SCIENCES will first be dealt with individually while addressing both the subject content and the subject approach in a dedicated Learning Outcome activity (Parts 1). Thereafter integration across the Learning Outcomes will be dealt with in a separate activity (Part 2).

Part 1: Outcomes and Content in the Life Sciences (9 Hrs)

FORM OF ACTIVITY: Presentation, interactive, report back and discussion

RESOURCES: PowerPoint Presentation, Laptop, Data Projector, Subject Statement, and Learning Programme Guidelines

CONTENT:

2.1. Analyse each outcome under headings
   2.1.1. Assessment Standards
   2.1.2. Subject Content

INSTRUCTIONS:
Use the following instructions to analyse each outcome of the Life Sciences. Each outcome is allocated 3Hours.

Assessment Standards (1 hr)

- Is progression evident in the Assessment Standards within the Learning Outcome across the three grades? Provide examples of such progression.
- Is progression evident in the Assessment Standards within the Learning Outcome of each grade? Provide examples of such progression.
- Is there a link between the Assessment Standards within the grade and across the grades? (I.e. What integration is possible within the Learning Outcome/s?)
- What must a learner demonstrate to show that s/he has achieved the outcome? (i.e. skills, knowledge and values)
- During reporting what competency descriptions would a learner achieve at level 4 in this outcome.
- What skills, knowledge and values are indicated in the Assessment Standards of this Learning Outcome?
- What LTSM is required to teach the content of this Learning Outcome to achieve the skills/knowledge/ values indicated in the Assessment Standards?

Report Back (30min)

Subject Content (1 hour)

- Do a critical study of the Grade 10-12 subject content for LIFE SCIENCES as provided in the Learning Outcomes in the Subject Statement (Chapter 3) and Learning Programme Guidelines (Annexure 1)
- What content is to be taught per grade for the Learning Outcome?

- What content is new – i.e. it is unknown to you?
- Are there any gaps in the suggested content? Name these.
- Should any of the content be re-organised to display progression across the grades? Identify this content.
- *"Assessment standards can be achieved by using 80% core knowledge and concepts indicated below as well as 20% context knowledge relevant to each province."*

Using the above statement found on page 32 of the Life Sciences subject statements.

- In your group provide examples of localised knowledge that could be used in each province to cover the required 20% context knowledge. Use any Grade 11 topic in your LPG (pp20 – 33).

Report Back (30min)

Part 2: Integration across the Learning Outcomes (2 hours)

FORM OF ACTIVITY: Presentation, interactive, report back and discussion

RESOURCES: PowerPoint Presentation, Laptop, Data Projector, Subject Statement, Learning Programme Guidelines

CONTENT: (1½ Hrs)

2.2. Content, integration and assessment.

INSTRUCTIONS:

Participants work in groups.

- Study the content for all three Learning Outcomes as addressed in Parts 1-3 and look for authentic links between the content in each.
- Participants critique the activity provided using the following:
  - Allocate the Outcome/s, Assessment standards and knowledge Area the activity is addressing.
  - Does the activity address integration of content from different Learning Outcomes?
  - Does the activity address the Assessment Standards of the integrated Learning Outcomes with respect to the skills, knowledge and values that will be acquired through exposure to the activity?
  - Input on assessment: Indicate how, when, who and what is this activity assessing – also make suggestions of the tools that can be used to assess learner performance in the activity and who should carry out the assessment to ensure that the integrated skills, knowledge and values are assessed in an effective and efficient manner.

Report Back: Groups give a report of their findings.

Part 3: Subject Approach (1½ hours)

FORM OF ACTIVITY: Presentation, interactive, report back and discussion

RESOURCES: PowerPoint Presentation, Laptop, Data Projector, Subject Statement, Learning Programme Guidelines, Handouts

CONTENT: (1 Hr)

2.3. Teaching Styles and Learning Styles

INSTRUCTIONS:

- Analyse various teaching, learning and assessment approaches shown below.
    - Together with your mitochondrion partner complete the table in the appendix:

- Find your chloroplast partner and make use of the information in the appendix to identify different kind of learning styles:
    - Fill in the column I in above table.

- Work with your partner to critique the given exemplar activities of the LIFE SCIENCES:
    - Is the activity appropriate for the developmental age of the learner?
    - Does the activity address the Assessment Standards of Learning Outcome with respect to the skills/knowledge/values that will be acquired through exposure to the activity?
    - Input on assessment: Include how, when, who and what is to be assessed in this activity – also make suggestions of the tools that can be used to assess learner performance in the activity and who should carry out the assessment

Report Back (30min)
Groups give a report back of their activities.
Facilitator wraps up the activity.

3.

ACTIVITY 3: Skills in Life Sciences' Outcomes (2Hrs)

FORM OF ACTIVITY: Group work and Discussion

RESOURCES: Overhead Projector, transparencies, Subject Statement, Learning Programme Guideline, Annexure on skills

CONTENT: (1½ Hrs)

3.1. Skills in the Life Sciences

INSTRUCTIONS:

- Link skills listed on the annexure in the appendix with each assessment standard in all outcomes. Record your work in a form of a table similar to the one in the appendix – Table 5. The first one has been done for you.

Report back: (30 min)
Each group gives a report back of their findings.

4.

ACTIVITY 4: Indigenous Knowledge in the Life Sciences (2 Hrs)

FORM OF ACTIVITY: Group work and Discussion

RESOURCES: Overhead Projector, transparencies, Subject Statement, Learning Programme Guideline, Handouts.

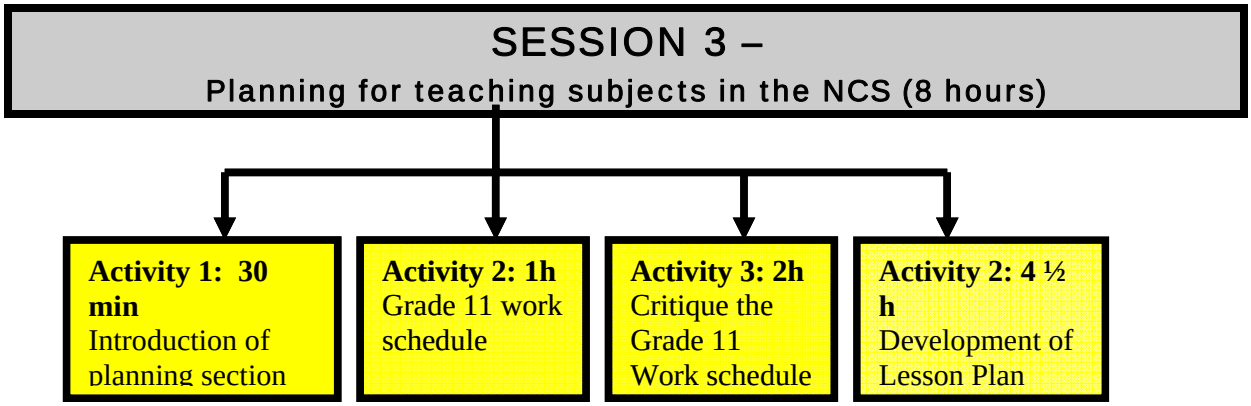
CONTENT: (1½ Hrs)
Examples of Indigenous Knowledge System

INSTRUCTIONS:

- Use Appendix 4 to select an example and use it as follows:
    - Select assessment standards from Learning Outcome 3 that address your example.
    - Give examples of Knowledge Areas (LPG – pp 20-33) that are addressed by your selected assessment standards.
    - Give examples on how your example can be assessed.

Report back: (30min)
Each group gives a report back.

Wrap up and Conclusion of the Session by facilitators.



1.

ACTIVITY 1: Introduction to the planning cycle (½ hour)

FORM OF ACTIVITY: Presentation and discussion

RESOURCES: PowerPoint Presentation, Laptop, and Data Projector

CONTENT:

1.1. Three stages of planning in a Learning Programme
1.2. Role-players in Planning
1.3. Time frame of each stage
1.4. Issues to consider when developing a Learning Programme
1.5. Brief overview of development steps in designing each stage of the Learning Programme.

INSTRUCTIONS:

Power point presentation is given by facilitator. Participants give comments and ask questions.

2.

ACTIVITY 2: Introduction to the Grade 11 Work Schedule (1 hour)

FORM OF ACTIVITY: Presentation and discussion

RESOURCES: OHP of Grade 11 Work Schedule, OHP Projector, OHP Pens, OHP Sheets, Subject Assessment Guidelines, Learning Programme Guidelines, and Subject Statement

CONTENT:

2.1. Presentation on elements of Work Schedule design.
- Integration: What, how and why?
- Sequencing: What, how and why?
- Pacing: What, how and why?

- Suggested assessment tasks: What and why? – will return to this in Session 4
- LTSM: What and why?

INSTRUCTIONS:
Power point presentation by facilitator is given on above topics. Participants give comments and ask questions.

3.

ACTIVITY 3: Critique the Grade 11 Work Schedule (2 hours)

FORM OF ACTIVITY: Interactive, report back and discussion

RESOURCES: Grade 11 Work Schedule, Subject Statement, Learning Programme Guidelines, Subject Assessment Guidelines

CONTENT: (1½ Hrs)

3.1. Grade 11 Work Schedule

INSTRUCTIONS:
Work in Groups to do the following:

- Study the example of the Grade 11 Work Schedule provided and critique it as follows:
  - Does the Work Schedule cover all the Assessment Standards of the grade?
  - Does the Work Schedule cover all the content of the Grade 11 Knowledge Areas?
  - Integration: Are the Assessment Standards appropriately linked?
  - Pacing: Is the time allocation across the 40 weeks appropriate?
  - Sequencing: Is the content presented in the progression order?
  - Are relevant LTSM (resources) listed? If not, list the LTSM required.
  - How can the Work Schedule be improved?

Report back: (30min)

- Groups present their improved version of the exemplar Work Schedule for Grade 11
- Participants engage in a discussion after each presentation.

4.

ACTIVITY 4: Development of the Lesson Plan for Grade 11 (4½ hours)

FORM OF ACTIVITY: Presentation, interactive, report back and discussion

RESOURCES: PowerPoint Presentation, Laptop, Data Projector, Subject Statement, Learning Programme Guidelines, Flip Charts, Koki's, and Prestik.

CONTENT:

4.1. Grade 11 Lesson Plan
  - Elements of Lesson Plan Design
  - Process of Lesson Plan Design

Part 1: Elements of Lesson Plan Design (30 min)

INSTRUCTIONS:
The facilitator presents an introduction to a Lesson Plan under the following headings:

- What is a Lesson Plan?
- What is its duration
- Elements and design of a Lesson Plan
    - Indicate The focus Learning Outcome
    - This is followed by focus Assessment Standard/s
    - Select relevant content and context
    - Develop activities that will address the relevant Assessment Standard/s and content and context.
    - Cater for diversity - expanded opportunities, and special needs
    - Include LTSM, time frames, assessment strategies and reporting and recording
    - Evaluation of the lesson Plan

Part 2: Designing a Lesson Plan (4 Hrs)

CONTENT: (3 Hrs)
Designing a Lesson Plan

INSTRUCTIONS:

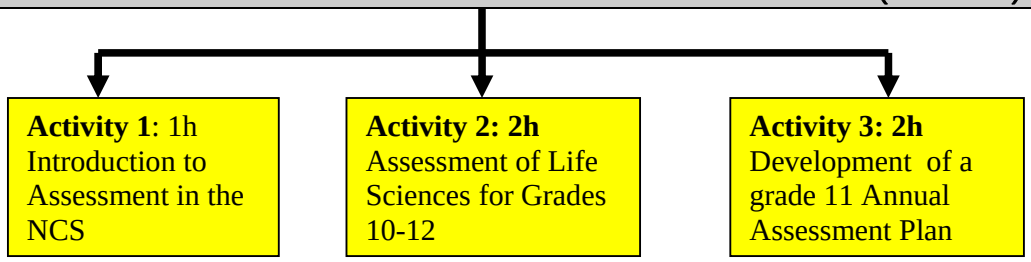
- The Facilitator draws the attention of participants to the elements of design process of a Lesson Plan
- Participants divide into groups and engage in the development of the Lesson Plan. Duration of the Lesson Plan to be the first 2-5 weeks of the school year according to the Grade 11 Work Schedule critiqued in Activity 3.

Report back: (1 Hr)

- Groups post their Lesson Plans on the wall
- One member of the group remains next to the poster to explain the lesson Plan to others.
- Participants engage in a gallery walk to critique and evaluate all lesson plans.
- Facilitator gives a wrap up of the activity.

SESSION 4 –

Assessment in the National Curriculum Statements (5 hours)



1.

ACTIVITY 1: Introduction to assessment in the NCS (1 Hr)

FORM OF ACTIVITY: Presentation and discussion

RESOURCES: PowerPoint Presentation, Laptop, Data Projector, National Protocol on Assessment

CONTENT:

1.1. Approach to assessment: Continuous assessment
  1.1.1. Daily Assessment
  1.1.2. Programme of Assessment
1.2. Internal Assessment in Grade 12
1.3. Recording process and Reporting
1.4. Monitoring and Moderation requirements
1.5. Portfolios: Teacher and learner

INSTRUCTIONS:

- The Facilitator gives a presentation using power point on the above content.
- Participants enter into a discussion.

2.

ACTIVITY 2: Assessment of Life Sciences for Grades 10 – 12 (2 Hrs)

FORM OF ACTIVITY: Presentation and discussion

RESOURCES: PowerPoint Presentation, Laptop, Data Projector, Subject Assessment Guidelines

CONTENT:

2.1. Programme of Assessment for Grades 10 and 11 (Section 2 of the Subject Assessment Guidelines):
  2.1.1. Number of tasks and weighting of tasks
  2.1.2. Nature of task
    2.1.2.1. Practical tasks
    2.1.2.2. Research projects
    2.1.2.3. Controlled tests and mid-year examination
    2.1.2.4. End-of-year examinations
2.2. Assessment in Grade 12 (see above)
2.3. Promotion and Certificate

INSTRUCTIONS:

- The Facilitator gives an interactive presentation using power point on the above content.
- Participants take part during presentation by asking and answering questions as well as making comments.

3.

ACTIVITY 3: Development of a Grade 11 Annual Assessment Plan (2 Hrs)

FORM OF ACTIVITY: Group work and Report back

RESOURCES: Wall charts, presticine, Koki's, Subject Assessment Guidelines

CONTENT: (1 Hr)

3.1. Programme of Assessment for Grade 11: Tasks, topics, tools and dates

INSTRUCTIONS:

- Each group designs an annual assessment plan for Grade 11 from the Programme of Assessment using the following:
  - Topics for each task
  - Assessment tools for each task
  - Date and duration of each task

Report Back and Wrap up: (1 Hr)

- Each group displays its poster on the wall. Other group do a gallery walk observing these.
- Each group then revisit their plans using the information they have gained from other groups.
- The facilitator asks participants to revisit the Grade 11 Work Schedule (Session 3: Activity 3) and to insert their annual assessment plan for Grade 11 with the assessment tasks in the Work Schedule.

APPENDICES

APPENDIX 1: 20 Questions

1. How many Learning Areas make up the NCS (Grades R – 9)?
2. How many subjects make up the NCS (Grades 10 –12)?
3. How many subjects are learners required to offer as minimum for the National Senior Certificate?
4. What are the compulsory subjects for all learners?
5. How many South African languages are included in the NCS?
6. How many foreign languages are included in the NCS?
7. At how many levels are the SA languages offered?
8. What is the minimum number of languages required for the NCS?
9. What is the maximum number of languages that can be offered for the NSC?
10. How many design features are there in the NCS?
11. Which design features are common to all subjects?
12. Which design feature is common to all grades?
13. Which design feature is specific to a grade?
14. Write down one Critical Outcome in your own words?
15. Which documents set out the content of each of the subjects which make up the NCS?
16. Which documents set out the assessment requirements for each of the subjects that make up the NCS?
17. Which documents provide guidance on planning to teach the subjects of the NCS?
18. Which document sets out the subject teaching plan for the year?
19. How many weeks should the plan cover?
20. The End

SESSION 1 – ACTIVITY 3 – PART 1

Make use of your knowledge of the NCS and related documents to answer the following questions.

- *Fill in the answers as quick as possible*
- *Keep answers short and to the point.*

No	Answer
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

SESSION 1 – ACTIVITY 3 – PART 3

Study the HE document and identify the requirements for certificate, diploma and degree programmes

HIGHER CERTIFICATE	DIPLOMA	BACHELOR'S DEGREE

APPENDIX 2: Worksheets

SESSION 2

Activity 1
Table 1

NATED 550 Biology Objectives	**Life Sciences Outcomes**
An understanding of the fundamental biological principles based upon a study of living organisms.	
An awareness of Biological relationships	
An ability to make critical, accurate observations of biological material, and to make meaningful records of such observations.	
An ability to analyse and evaluate biological information, to formulate hypotheses and to suggest procedures to test them	
An ability to communicate clearly when reporting information an expressing ideas	
A respect for all living things and an urgent awareness of man's responsibilities in the preservation of life, particularly in the S.A. context	
A love and appreciation for the South African fauna and flora and a recognition of the urgent need for conservation	

Activity 2
Table 2

Grades	Biology NATED 550 (Comments)	NCS Content (Comments)
Grade 10 Topics		
Grade 11 Topics		
Grade 12 Topics		

Activity 2
Table 3

Teaching style	Learner centred Or Teacher centred	Comments (Indicate advantages /disadvantages)
E.g. Chalk and talk	Teacher centred	Learner participation is minimal. Not much conceptual development occurs.

Activity 2
Table 4

Multiple Intelligences

Learning style	Learning characteristics
	Thinks in words. Likes reading, writing, listening & speaking. Does well with books, dialogues, debates.
	Likes reasoning. Likes to organise and interpret data, Does well at maths & science problem solving
	Thinks in images. Likes drawing and observing. Does well at mind-mapping, puzzles, graphics
	Thinks rhythmically and in tunes. Likes music and dance. Often taps and hums
	Thinks through sensations. Likes sport, drama, movement, physical
	Thinks best with other. Likes co-operative & group activities. Good at interactive, people centred activities
	Thinks best alone. Likes individual self-paced and managed activities. Reflective and quiet
	Creating an understanding and meaning through the world, excursions and research

Activity 3
Table 5

Skill	**Sub-skill/s**	**Grade, LO and Assessment Standard/s**
Planning	Hypothesising	Gr12 - LO1 – AS1

Activity 4
Table 6

Assessment standard	Example

WORKSHEET: Lesson Plan

SESSION 3 – ACTIVITY 5 FIRST GRADE 11 LESSON PLAN				
SUBJECT: LIFE SCIENCES LESSON PLAN: 1 DURATION: 12 hours		GRADE: 11 NO. OF ACTIVITIES: WEEK / DATE: Weeks 1-6		
CONTEXT: TISSUES, CELLS, AND MOLECULAR STUDIES				
LINK WITH PREVIOUS LESSON: STRUCTURE OF VIRUSES AND BACTERIA		LINK WITH NEXT LESSON: IMMUNITY		
CORE CONTENT (KSVs): Study the Structure of viruses, bacteria, protists, and Fungi, choose one related disease and outline its cause, effects and management, from each of the four groups viruses, bacteria, protists, fungi. Discuss immune response against drugs by infecting organisms, Immune response by organisms against infecting agents				
	ACTIVITY 1	ACTIVITY 2	ACTIVITY 3	Etc.
LOs & ASs: LO1.1 LO2: 2 LO3.1				
CORE CONTENT:				
DETAIL OF ACTIVITY:				
TEACHING METHOD:				
ASSESSMENT STRATEGY:				
EXPANDED OPPORTUNITIES:				
RESOURCES:				
TEACHER REFLECTION:				

WORKSHEET: Annual Assessment Plan

SESSION 4 - ACTIVITY 3
ANNUAL ASSESSMENT PLAN FOR GRADE 11

SUBJECT: LIFE SCIENCES GRADE: 11 YEAR: 2007

TERM 1	TERM 2	TERM 3	TERM 4
TASK 1 LO(s) and Topic: Type of assessment: Date: Duration: Tool:	**TASK 3** LO(s) and Topic: Type of assessment: Date: Duration: Tool:	**TASK 5** LO(s) and Topic: Type of assessment: Date: Duration: Tool:	**TASK 7** LO(s) and Topic: Type of assessment: Date: Duration: Tool:
TASK 2 LO(s) and Topic: Form: Date: Duration: Tool:	**TASK 4** LO(s) and Topic: Form: Date: Duration: Tool:	**TASK 6** LO(s) and Topic: Form: Date: Duration: Tool:	

APPENDIX 3: Life Sciences Skills

Some Examples of Skills Developed in Life Sciences

1. Inquiry Skills

Skill	Sub skill	Description
Inquiring	Conceptualising skills	Knowledge
		Comprehension
		Application
		Analysis
		Synthesis
		Evaluation
	Reflective skills	

2. Motor/ Process Skills

Skill	Sub skill	Description
Planning skills	Identify phenomena	
	Questioning skills	Ask questions Refine the language and sciences question
	Make predictions	Generate logical predictions
	Hypothesising	Recognize. generate state/formulate hypothesis
	Formulate and design action plans/experiments/ Procedures	Design trials / surveys / Design a Laboratory / field test Identify control/ uncontrolled and measure variables Choosing the correct apparatus Planning the sequence of the design
	Recognize experimental and technical problems inherent in experimental design	Finding out problems associated with apparatus and the processes
	Criticize faulty experiments	Finding out the problems associated with the apparatus, experimental design, as well as Conceptualization
Data gathering and Manipulation skills	Measurement	Reading linear scales and dimensional scales. Scaling. Measuring out quantities Systematic counting
	Observation	Matching Describing objects and processes Identifying differences / similarities in diagrams/objects Identifying differences /similarities between words/data Identifying problems
	Collecting and selecting	Completing prepared tables Plotting

	data	graphs Constructing graphs
	Handling apparatus and material	Assembling of common apparatus Handling of common apparatus/ equipment Handling of materials/ chemicals Preparation of materials/staining slides etc. Precautions to be taken
	Experimenting	Recognize that only one independent factor in an experiment is variable. Identify uncontrolled variables. Suggest appropriate controls. Specify the apparatus.
	Classifying	
	Drawing graphs	
	Follow instructions	
	Making models	
	Comparing sources of information	
Interpreting and analysing skills	Identify trends / patterns	See elements in common to several items of data
	Reflect on the reliability and validity of findings.	Accurate calculations Anomalous results and explain variation in results.
	Evaluating hypothesis	
	Drawing conclusions	Evaluate the relevance of data and draw valid conclusion
	Justify conclusions	
	Analysing information	Tables /graphs/ charts/ diagrams
	Transfer and apply conclusions to new situations.	
	Problem solving	
	Responsible decision making	
Communication and transformation / translational skills	Translation of data	Data transformation into diagrams, tables, graphs
	Share findings	
	Different way to present findings	Different types of graphs, line graphs, pi graphs, bar charts and histograms
	Reporting	
	Adapting the report for different audiences	

3. Life skills (values and attitudes)

Skills	Sub skills	Description
Communication skills	Recording and communicating findings	Group work, Team based investigations, Presentations, Interviews, Debates, Discussion, Writing paragraphs, essays and producing summaries
	Strategy inference	
	Integrate and Retrieve information from different sources	Use different source materials and the media centre
	Use correct scientific language	Daily basis enriching word power
Personal skills	Awareness of achievements and successes	Group discussions Experimental investigations Continuous assessment, tests, exercises, revision assignments and progress reports
	Awareness of areas requiring further development	
	Study skills	
	Acceptance of emotions, values, morals, cultural differences	
	Pattern recognitions	
	Problem solving strategies	
	Self-confidence	
	Presenting skills	Presentation of results or opinions in front of the group/class
	Public speaking	
	Leadership qualities	
Technical skills		
Problem solving skills		
Personal and social values/ethics skills		Awareness of disease and epidemiology. Modern Scientific research on the human race. Modern scientific and social issues. Social and community issues. Sharing stress and its causes. Investigation into "life processes" in organism
Career selection		Excursions Interviews Projects Discussions

APPENDIX 4: Indigenous Knowledge Resource Material

- ***Ndima*, an ancient land-use principle restored**

The practice '*ndima'* is found in the northern province of South Africa. *Ndima* is a principle rather than an activity. It offers a way to restore community access to natural and cultural resources, ultimately enabling the community to make sustainable use of those resources. Restoration was necessary as the people of this region had been deprived of their land under the previous regime. The practice revives an ancient land-use principle as a way of acknowledging the communities' right to property as it existed prior to their dispossession. The restitution of land rights is a first step in the process towards sustainable development. Restored access to resources should lead to a revival of community life and therefore to improvement in the quality of the lives of everyone living in these communities. *Ndima* Community Services is the name of the NGO which, in cooperation with 12 rural communities in South Africa, is responsible for this practice.

- **Pigeon peas and coconut husks: a way to increase productivity**

The pigeon pea is an important crop in rural areas of Zanzibar, Tanzania. To reduce the damage caused by rodents, farmers place coconut husks at the base of pigeon pea stems. When the pea pods begin to form, two to four cut halves of coconut husks are placed around the pea plant, curved side up. Normally, dry husks are used since they are more slippery. The rodent slides off the husk before it can reach the branches that hold pea pods. Other purposes of the practice are:

• to increase the canopy of the plant and thus the amount of light the plant absorbs (this encourages more pods to form);

• to fertilize the soil as the husks decompose.

The placing of coconut husks at the base of pigeon pea plants has been widely observed to increase the number of pods and to reduce damage by rodents. This locally invented practice is simple and cheap, and it improves yields. The practice is transmitted as younger generations observe and talk about the practice. A weakness is that under certain conditions the husks can harbour pests as they decay. The practice could be applicable in other contexts, anywhere that coconut husks are available.

- **The use of *Erythrophleum sauveolens* as natural pesticide in Nigeria**

During the growing season, when the crops are fully established, community leaders in Niger State (Nigeria) warns everyone to keep their livestock away from the fields. To keep roaming herds away, farmers have placed branches of *Erythrophleum sauveolens* (locally known as '*saci'*) around their farms. Animals that eat the leaves will bloat and die. *Saci* is also used in powder form to protect farms against insects, birds and rodents. The powder is made from bark of the plant. It is mixed with seeds, which are moistened so that the powder adheres well. The poisoned seeds are then placed in the animals' pathways.

- **The use of *neem* to control insect pests in vegetables**

Insects are a hindrance to resource-poor producers of vegetables. For the battle against insects, chemical pesticides are too expensive and have negative side effects. In the western district of Zanzibar (Tanzania), farmers are now making use of a botanical pesticide that is locally available at nearly no cost: the leaves of neem (*Azadiracta indica*), a tree that grows in many tropical countries. There are two ways to prepare the leaves for use as pesticide, namely by soaking or boiling. In the first method, the leaves are ground, put in water and seeped for 24 hours. The seeped mixture is brushed on the plants three times a week, a process that some farmers find too laborious. After seeping, the remaining ground leaves can be spread under the plant to increase soil fertility. The boiling method is less attractive because it requires fuel, which is often hard to come by. The method could be improved by reducing the mixture to a powder.

- **Husks of kola nut pods as poultry feed**

In the April issue we wrote about how the husk of the kola nut pod is used in Nigeria as fertilizer. This short article describes its use as chickenfeed. In southwestern Nigeria smallholder poultry farmers were looking for alternative ways to feed poultry so as to reduce the competition between people and poultry for cereal grains. Together with researchers of the Cocoa Research Institute of Nigeria (CRIN), the farmers found they could substitute the ground husks of kola nut pods for up to 60 per cent of the maize that chickens had been remedy, however, risks biodiversity when it is being spread orally. *Nai* is a plant growing only in the wild and barren areas. Total number of the plant is but average, and these factors combined would lead rather soon to relative overexploitation. This case shows that not all IK is sustainable!

- **Treating diarrhoea in cattle**

In the same district mentioned above, farmers in livestock management make use of a mixture of plants to treat diarrhoea. For this purpose, they collect leaves of the pipal (*Ficus religiosa*), babool (*Acassia spp.*), and guava trees to crush them with finger millet flowers. Mixed with water and a little salt, it is administered three times a day to cattle suffering from diarrhoea. Dosage depends on body weight but after 4 - 6 days most animals are cured.

- **The use of *bhelwa* seed for the control of foot and mouth disease**

Foot and mouth disease is one of the common dangerous diseases that animals can get during the rainy season (June to August). To cope with it, farmers boil the extract of the *bhelwa* seed with mustard oil. The practice is more than nine decades old, and all that time has been in continuous use. The *bhelwa* tree grows in the wild and has tremendous value, for it is said that it can cure more than 20 diseases (human as well as animal). The seed of the *bhelwa* is collected from the wild and boiled together with 50-100ml of mustard oil for about ten minutes. The solution is dropped on the wound on the animal's foot three times a day. This practice is repeated for up to three days. Dosages must be very precise

because the seed is poisonous and an injudicious dose can kill an animal. Since the use of *bhelwa* requires such expertise, great care should be taken any time this practice is transferred to other areas. The practice offers opportunities for researchers: how to increase the efficacy of the practice, and how to neutralize the poisonous effect.

- **Hammering *dhow* nails into fruit trees; a measure for reducing fruit fall and increasing productivity**

In rural areas of Zanzibar (Tanzania), growers of fruit (mango, rambutan, coconut, durian, etc.) have a practice that increases fruit production. The farmers developed the method themselves more than three decades ago. It involves hammering two to six *dhow* nails into the main stem of each fruit tree. The nails are left there permanently.
As soon as farmers notice that a tree is late in bearing fruit or that fruit is falling from the tree prematurely, they hammer in the nails. This is usually done only once in a tree's lifetime. The following season, the tree will bear more fruit that also remains on the tree longer. The nails inject iron into the tree. *Dhow* nails are commonly made by local smiths from the remains of old cars and other materials containing iron. The nails have a length of around 10-20 cm. The method is cheap because the nails are locally available at a reasonable price.

- **Indigenous strategies for keeping goats from damaging maize crops in the dry season**

In Bomaka, in the southwest province of Cameroon, maize can be planted twice a year, (March-April and August-September). During the rainy season in March-April, goats are tethered on areas with pasture, so that they do not destroy maize crops. At the end of August, however, when the maize has been harvested, the goats are allowed to roam and graze freely. This presents a problem to farmers who also plant a dry-season crop in August- September. To prevent stray goats from grazing on this second maize crop, farmers use the droppings of the goats themselves as 'goat repellent'. Goat droppings are collected in a bucket. These are usually abundant where goats pass the night. Water is poured onto the droppings and left for two days to soften them. The water is then filtered and collected in another container. The droppings are mashed with a pestle and stirred into the water to form a homogeneous suspension. A palm frond broom is used to sprinkle the watery mixture onto the growing maize. This is done on a dry sunny day so that the repellent dries quickly and sticks to the plants. The smell of their own droppings puts goats off. This indigenous repellent has three merits: it is free, simple to prepare and effective. Two or three applications of the repellent are sufficient. This is best done immediately after weeding, at three-week intervals after the maize has germinated. When the maize crops grow tall and start producing cobs, a different method is used to prevent goats from damaging the maize crop. It is simply not to weed the field any longer. At this stage, grass can no longer drastically affect the yield of the maize. The domesticated goats do not like to forage in thick grass, especially if it contains a large amount of inedible grass, which is the case on plots that are being farmed for the second time in the same year.

- **Keeping cattle overnight in orchards**

Since the 1970s many farmers in Ndijani, Zanzibar (Tanzania) have shown great interest in citrus production, after realizing that this would generate a higher household income and improve the nutritional status of their household. A few farmers in the village discovered it is possible to improve the soil fertility of the orchards by letting cattle stay there overnight. This practice was soon adopted by other farmers. After grazing during the day on the common land, the cattle are moved to the orchard in the evening. They are tied to an iron bar with ropes. The cattle are arranged in such a way that each one can freely move around in a radius of about of 3 – 4 m without damaging the citrus trees. The cattle are kept there every night for a period of about 10 – 15 days. After this period, the cattle are shifted to the next sub-plot of the orchard until the whole orchard has enough manure for the citrus trees as well for vegetable production (vegetables have a high market value as a result of the expansion of the tourist industry in Zanzibar). Farmers grow a wide variety of vegetables. During the vegetable season, the manure is mixed with the topsoil using a hand hoe. Farmers who do not have cattle rent them from their neighbours at a cost of about TZS 8,000 (about USD 10) for 10 - 15 cattle for a period of 10 - 15 days. A few farmers do this every year, but the majority fertilize their orchard in this way every two years. Nowadays the majority of the farmers at Ndijani believe that a good citrus farmer must have livestock. The practice has been tried elsewhere on the Zanzibar islands, albeit on a smaller scale.