



conservation education

ENVIRONMENT IN THE CURRICULUM

A resource to support local action and learning for sustainable living
in the National Curriculum Statement.



Environment in Economic and Management Sciences

In the new curriculum, environment and opportunities for environmental learning appear in all Learning Areas. Based on the vision and values of the South African Constitution, a key curriculum principle is to promote a healthy environment, human rights, social justice and inclusivity. This

principle is reflected in required Learning Outcomes and Assessment Standards, specified contexts and core content, which all support environmental learning. Not surprisingly, therefore, environmental learning must be assessed as part of the formal curriculum.



The Economic and Management Sciences Learning Area prepares learners to participate in an economically complex society, where productivity, social justice and a healthy environment are key concerns. Learners become literate and develop basic skills as consumers, entrepreneurs and managers of tasks, money and other resources. They need to understand and apply economic and management principles responsibly, and to reflect critically on the wealth creation process. They consider how economic activities (like the

manufacturing of various goods, from cars to food) have an impact on environment and society. Seeing the world as a set of related and inter-dependent systems is vital, and learners consider how economic activities depend on the wise use of resources, including land, water and biodiversity, and how economic activity can support the environment and society in a sustainable way (e.g. the reduction and recycling of waste, the fair sharing of the wealth created from the earth).



This pamphlet introduces service providers and educators to 'environment' in the Economics and Management Sciences (EMS) curriculum for Grades R-9, and aims to give a sense of how one might work with the curriculum requirements and opportunities. We

illustrate some of the many relevant Learning Outcomes, Assessment Standards and contexts, focusing on biodiversity. To see where else environmental learning features in EMS, in other Learning Areas, or in the Grade 10-12 curriculum, please consult the National Curriculum Statements.



The Learning Outcomes (LO) Apply to All Grades

Assessment Standards (AS)

Foundation Phase Grades R-3

We give examples from Grades 2 & 3

Learning Outcome 1

The Economic Cycle

Learners will be able to demonstrate knowledge and understanding of the economic cycle in the context of the 'economic problem'.

Grade 2, LO1, AS5:

Express the importance and ways of saving and not wasting money and other resources such as water and electricity.

Grade 3, LO1, AS1:

Describe ways in which the household or school can generate income from waste materials, or save money by recycling.

▲ To work towards this AS, learners could explore what water and electricity costs their family, how the Earth is affected when we use too much water or produce electricity; and how we reduce waste when using these resources. Teach how using resources carefully both saves money and helps the Earth, and why both of these are important.

▲ Generate income by recycling paper, cardboard, tins, glass; save money by mending old bicycles, clothes and/or running a second-hand shop. If you have a garden, recycle food scraps in a compost heap and save money on fertilizer, recycle tyres as planting beds ...



Learning Outcome 2

Sustainable Growth and Development

Learners will be able to demonstrate an understanding of reconstruction, sustainable growth and development and to reflect critically on related processes.

Grade 2, LO2, AS4:

Identify available resources used to create innovative and marketable products.

Grade 3, LO2, AS4:

Collectively plan or run a real or simulated classroom enterprise responsibly by selling or making goods for a market.

▲ Show the learners how to make something fun out of old boxes and bottle tops, to sell or give as gifts! Let them discover other resources that could be used, or have been used, in this way.

Learning Outcome 4

Entrepreneurial Knowledge and Skill

The learner will be able to demonstrate entrepreneurial knowledge, skills and attitudes.

AS) Change and Progress from Grade to Grade

Intermediate Phase Grades 4-6

We give one example from Grade 4

Grade 4, LO1, AS2:

Explain the effects on the community of both responsible and irresponsible use of resources and services.

▲ To work towards achieving this AS, learners could explore the use of resources such as petrol, water, fire wood, shell fish, bait ... and services like nature conservation and law enforcement, and others.

Community resources could include abundant wild plants which could be sustainably harvested; pleasant areas where visitors would like to hike, picnic or watch birds; or the facts about nature which knowledgeable community members might have.



Senior Phase Grades 7-9

We give an example from Grade 7

Grade 7, LO1, AS1:

Explain needs and wants and how differences between them impact on communities and the environment.

▲ We *need* things like healthy foods, enough water, homes, the chance to learn, be creative and contribute to society. Our *wants* for great variety in food, for swimming pools and lush lawns, big houses or huge meals, can be bad for our health, and strain the Earth as more natural resources are used, and more pollution created. At the same time, many people's needs are not being met, and inequality increases, causing many social ills.



These are only some of the **Assessment Standards for EMS** - take a look at the others, including those for **LO3**.

Grade 7, LO4, AS2:

Use idea generation techniques to make recommendations on using community resources to generate income in a responsible way.

Stories of Possibilities

Working with the GET Economic and Management Sciences Curriculum

A teacher's story: "We are a school for learners with special needs, and proud to be an Eco-School. We earned our Green Flag by running a food garden and soup kitchen which feeds the learners and community, by installing a water tank and other water-saving devices, and by basing some of our lesson plans on these activities. All the staff participate in the programme, and every year, when we plan our programmes for the next year, we look at how we can draw on our

Eco-Schools activities as a curriculum resource. I teach the Foundation Phase (Grades R-3). That means I teach three learning programmes: Literacy, Numeracy and Life Skills. For the Life Skills learning programme, I need to work towards the Assessment Standards of Life Orientation, Social Sciences, Arts and Culture, Technology and EMS. I'll give you an example of how I've drawn on the food garden for my Grade 3 class:



The learners help in the food garden, to learn life skills for when they need to look after themselves – although I don't assess them on this, as it is not a curriculum requirement. What they do have to show me, is that they can explain recycling. There are many examples of recycling in our garden – we use tyres for built-up beds in which the learners can work, even if they are in wheelchairs or on crutches. We re-use grey water from the hostel's showers and kitchen. We recycle vegetable peels in a compost heap and use this to replace nutrients in the soil. When the

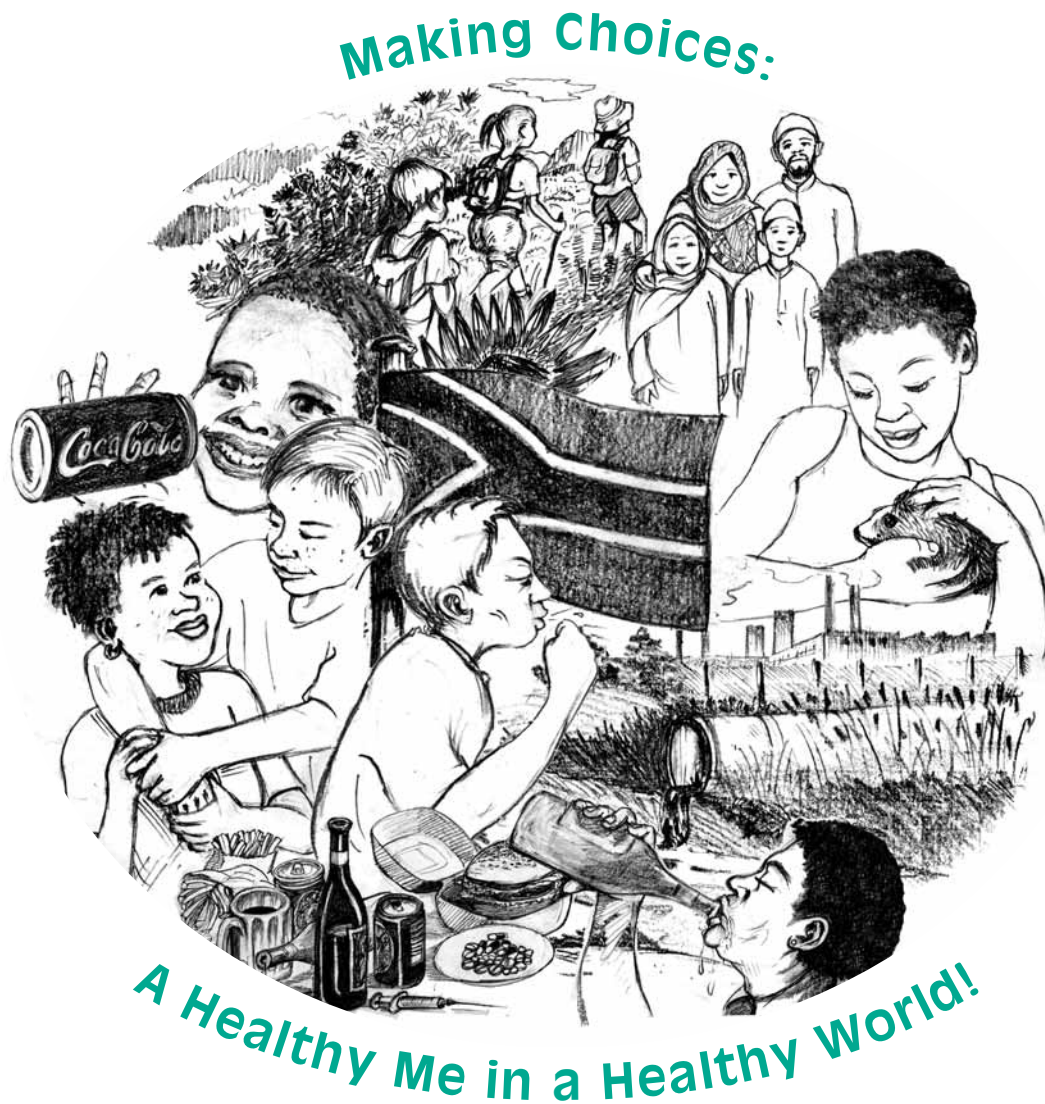
learners can explain how this helps the environment and saves money, and why this is important, they have achieved Assessment Standards for EMS, Life Orientation and Social Science! Next year we will start a stall for selling our produce; while the Grade 3s will not work in it, they will help to do the planning and calculations, and again this is something I can assess, to see if they've achieved the EMS Assessment Standards".

Inspired by Harding Special School, Kokstad

Environment in Life Orientation

In the new curriculum, environment and opportunities for environmental learning appear in all Learning Areas. Based on the vision and values of the South African Constitution, a key curriculum principle is to promote a healthy environment, human rights, social justice and inclusivity. This

principle is reflected in required Learning Outcomes and Assessment Standards, specified contexts and core content, which all support environmental learning. Not surprisingly, therefore, environmental learning must be assessed as part of the formal curriculum.



Life Orientation helps learners to make responsible decisions about their health and the environment. Learners and their communities can only be healthy if the earth is healthy too. People need clean water, fresh air, nutritious food and safe surroundings. We even need to enjoy the beauty of nature as we exercise outdoors. In Life Orientation, learners actively participate by identifying environmental

health issues in their homes, school and community. They explore what we can do to make our world safer and healthier. From early on, they learn to make choices and take action for good health and healthy surroundings. The diversity of plants and animals are part of healthy ecosystems – like farms, rivers, oceans – which play a vital role in the health of people and planet.



This pamphlet introduces service providers and educators to 'environment' in the Life Orientation curriculum for Grades R-9, and aims to give a sense of how one might work with the curriculum requirements and opportunities. We illustrate some of the many

relevant Learning Outcomes, Assessment Standards and contexts. To see where else environmental learning features in Life Orientation, in other Learning Areas, or in the Grade 10-12 Life Orientation curriculum, please consult the National Curriculum Statements.



The Learning Outcomes (LO) Apply to All Grades

Assessment Standards (AS)

Foundation Phase Grades R-3

We give examples from Grades 2 & 3

Learning Outcome 1

Health Promotion

Healthy Environment, Healthy Me

Learners will be able to make informed decisions about personal, community and environmental health.

Grade 2, LO1, AS2:

Suggest and investigate actions to make the home and school environment healthier.

This could be taught in the context of food gardens, waste disposal, a play park, or a foot patrol at a busy road, for example.

Grade 3, LO1, AS2:

Participate in a recycling project and explain how recycling contributes to environmental health.

This could be taught in the context of recycling at school or in the community, for example paper, glass, tin, compost.

Learning Outcome 2

Social Development

Rights and Responsibilities

Learners will be able to demonstrate an understanding of and commitment to constitutional rights and responsibilities and to show an understanding of diverse cultures and religions.

Many other relevant Assessment Standards are left out here - why don't you look them up!



Life Orientation also has 3 more Learning Outcomes featuring environmental learning. Do look them up in the policy documents!

AS) Change and Progress from Grade to Grade

Intermediate Phase Grades 4-6

We give examples from Grade 5

Grade 5, LO1, AS2:

Investigate a local environmental health problem using different data sources and plan a strategy to address the problem.

Environmental health problems might be a lack of safe, green play areas; hunger in the community; poor waste disposal; too much junk food; no toilets at school; polluting traffic. Programmes to respond could include creating a food garden or park; or a waste management campaign.

Grade 5, LO1, AS3:

Recognise the symptoms and causes of locally occurring diseases and discuss prevention strategies.

Grade 5, LO2, AS1:

Apply children's rights and responsibilities to a range of problem situations.

The Constitution gives children the right to a healthy environment, and they can call on this right when demanding that authorities provide them with clean water, for example.



Senior Phase Grades 7-9

We give examples from Grade 9

Grade 9, LO1, AS2:

Develop and implement an environmental health programme.

Grade 9, LO1, AS1:

Illustrate and evaluate the influence of ecological, social, economic, cultural and political factors on own choice of diet.

Grade 9, LO2, AS2:

Report on participation in or planning of the local celebration of a national day.

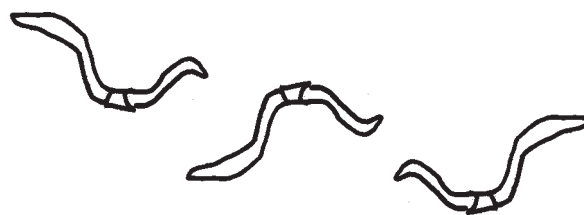
Consider launching an environmental health programme in Environment Week, Water Week, or on Human Rights Day!



Stories of Possibilities

Working with the GET Life Orientation Curriculum

A Foundation Phase teacher confesses: "I've been working with the NCS for a while now, but I'm still unsure about the 'healthy environment' element! This year a service provider helped me a lot, though. I told them I struggled with the Grade 3 Assessment Standard which requires the learners to *participate in a recycling project*. We don't have a recycling project at the school and I wasn't sure how to set one up. Someone said I must get learners to collect paper, tins or bottles, and get a recycling company to come and collect the materials from school. But as we are far off the beaten track, no-one was interested in collecting from us. I started to panic, as I had to assess the learners against this Assessment Standard before they could pass Grade 3! Then I met someone from an NGO who works on waste. They said that making compost is also a form of recycling – you recycle certain food scraps and garden waste in the soil, and this helps the environment as it makes the soil more fertile, so that we can grow more food, while reducing the amount of waste that goes to the dump.



The service provider showed me how to make compost in a bottle! The learners collected the materials we needed: 2 litre plastic bottles, soil, water, plant material, some paper snippets, vegetable peels, and even earthworms! We practised making a few bottles, some flopped and some worked well, and we learned from all of them. The learners were not only doing (participation skills), they could also explain what could go into the compost and why, and how this process of food recycling in nature helps to keep the earth healthy (*knowledge and values*). They love their earthworms, nature's big recyclers, and are taking them home over the holidays. Next year I'm definitely starting a compost heap outdoors."

An Intermediate Phase teacher explains: "I teach Life Orientation in a rural area. We've been experiencing outbreaks of cholera here. So for the Health Promotion outcome of Life Orientation (LO1) for Grade 5, I used the context and content of cholera. Cholera is a communicable disease which is linked to the Life Orientation concepts of environmental health and personal hygiene, because the disease spreads through people using polluted water, not taking care when going to the toilet or not washing hands before handling food. So as part of my Learning Programme this year I taught two lessons on cholera, using information from the Wildlife & Environment Society, Department of Water Affairs, and our clinic. We read a true story of a man who had contracted the disease, a fact sheet on prevention, and studied a poster of the life cycle of the disease. It was not so much the science that I wanted learners to grasp, as how to recognize and prevent the disease through how we handle ourselves, our bodies and our food - basic life skills, which is a focus in Life Orientation.

After the lesson I could assess the learners against three Grade 5 LO1 Assessment Standards: *Explore and report on ways to protect the quality*

of food and water in various contexts (e.g. preparing food with clean hands and utensils, and boiling water or adding Jik); *Investigate a local environmental health problem using different data sources, and planning a strategy to address the problem* (this was the problem of local water infected with cholera, or lack of access to clean water, and our strategy included boiling water and adding Jik, but also writing to the Municipality to point out that there are not enough toilets, so people pollute the river); and *Recognise the symptoms and causes of locally occurring diseases and discuss prevention strategies*.

Next year I'll work with the same learners in Grade 6. I'll have to introduce other communicable diseases besides cholera then, for example HIV/AIDS, which is another issue we face here. In Grade 6 learners must progress and study topics in more depth, for example I'll introduce the Life Orientation concepts of community norms and personal values in relation to HIV/AIDS.

I'm also thinking of using access to clean water as an environmental health issue, when teaching towards LO1 and LO2 in Grade 6. I might team up with the science teacher to make links between biodiversity and health. We should plan this soon, in time for next year!"

Environment in Natural Sciences

In the new curriculum, environment and opportunities for environmental learning appear in all Learning Areas. Based on the vision and values of the South African Constitution, a key curriculum principle is to promote a healthy environment, human rights, social justice and inclusivity. This

principle is reflected in required Learning Outcomes and Assessment Standards, specified contexts and core content, which all support environmental learning. Not surprisingly, therefore, environmental learning must be assessed as part of the formal curriculum.



The Natural Sciences Learning Area teaches learners science process *skills*; to interpret and use scientific, environmental and technological *knowledge*; and to come to *value* and take responsibility for relationships between science, technology, people and environment. While learners plan and conduct inquiries using diverse sources of information, including their own investigations, they come to know and appreciate the workings of the natural world and how

ecosystems benefit people. At the same time learners are challenged to consider critically people's interactions with nature, including the impacts of technology, and to suggest solutions. The three Natural Science Learning Outcomes and the specified content for the different phases, provide opportunities for studying local plants, animals and ecosystems, investigating our impacts on biodiversity, and to do problem-solving around conservation issues.



This pamphlet introduces service providers and educators to 'environment' in the Natural Sciences for Grades R-9, and aims to give a sense of how one might work with the curriculum requirements and opportunities. We illustrate some of the many relevant Learning Outcomes,

Assessment Standards and content, focusing mainly on biodiversity. To see where else environmental learning features in the Natural Sciences, in other Learning Areas, and in the Grade 10-12 Life Sciences curriculum, please consult the National Curriculum Statement.



The Learning Outcomes (LO) Apply to All Grades



Learning Outcome 1 Scientific Investigations

Learners should be able to act confidently on their curiosity about natural phenomena, and investigate problems in scientific, technological and environmental contexts.

Learning Outcome 2 Constructing Science Knowledge

Learners should know and be able to interpret and apply scientific, technological and environmental knowledge.

Learning Outcome 3 Appreciating Relationships and Responsibilities

Learners should be able to demonstrate an understanding of interrelationships between science and technology, society and the environment.

Assessment Standards (AS)

Foundation Phase Grades R-3

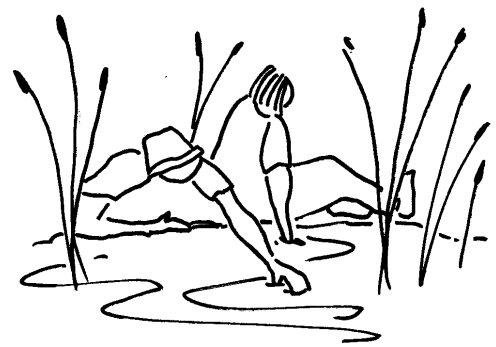
We give one example from Grade 3

Assessment Standards are taken from the Curriculum Framework for School Education. Examples follow

Foundation Phase: my body and its needs for healthy foods and clean water; plants and animals and how they change as they grow; how people depend on plants and animals for food.

Grade 3, LO1, AS2:

Participate constructively in an investigative activity with understanding of its purpose.



AS) Change and Progress from Grade to Grade

Intermediate Phase Grades 4-6

We give examples from Grades 5 & 6

Senior Phase Grades 7-9

We give examples from Grade 7

ught through the specified core knowledge and concepts for each phase.
w for each phase (for more, see the NCS for Natural Sciences):

Intermediate Phase: ecosystems, interdependency, animal and plant habitats; water in ecosystems and impact of human activities on water, catchment management and water quality; sources of energy in nature; soil composition and properties; fossils as indicators of environmental change.

Senior Phase: photosynthesis, animal behaviour, adaptations, food webs, biodiversity, and the impact of pollution on natural processes.

Grade 5, LO1, AS2:

Carry out instructions and procedures involving a small number of investigative steps.

Grade 6, LO1, AS2:

Conduct simple tests or surveys and record observations or responses.

Grade 7, LO1, AS2:

Organise and use equipment or sources to gather and record information.

Why don't you look up some of the Assessment Standards for LO2.



Grade 5, LO3, AS2:

Identify positive and negative effects of scientific developments and technological products on the quality of people's lives and/or the environment.

Grade 6, LO3, AS2:

Suggest ways to improve technological products or processes and to minimise negative effects on the environment.

Grade 7, LO3, AS2:

Analyse information about sustainable and unsustainable use of resources.

Stories of Possibilities

Working with the GET Natural Sciences Curriculum

A teacher's story: "I teach the Natural Sciences in a primary school. I have always had a passion for nature, and I tried to bring environmental issues into my teaching, especially as we are from an area where the learners don't get much other exposure. So I was glad to find that the new curriculum makes such good provision for environmental education.

Last year water pollution hit the news locally, and this year I made this my focus for the second term. It fitted well with the required knowledge content for the Intermediate Phase, because the Core Knowledge includes *Water plays an important role in ecosystems, sustaining both plant and animal life. Industrial, agricultural and domestic activities may have a serious impact on the quality and quantity of water available in an area.*

Our school had budgeted for a local field trip, so I took my Grade 6 learners to the river which flows through our area. In preparation for the trip, I used a newspaper article on the local pollution as a 'tuning in' activity in the classroom, and we discussed the river as an example of an "ecosystem". Then I demonstrated a jam-tins-in-a-pyramid activity, to mobilise what they had previously learnt about ecosystems, e.g. that people are connected to animals, plants, water and soils. When I saw that everyone was 'tuned in' to the topic, we brainstormed how we as junior scientists would find out if our local river ecosystem was polluted. What kinds of questions should we ask? How could we get answers? You can see that I had the Learning Area purpose in mind, and was teaching towards the Grade 6 Assessment Standard 1, *Plan Investigations* (for LO1: *Scientific Investigations*).

I then introduced the learners to the SWAP water quality testing kit (which also comes in a tin!). A service provider showed it to us on a course I attended last year. So I explained to the learners how it worked, and how it could help us answer our questions. The tin contains a number of simple tests for water quality, e.g. identifying insects and other water life, interviewing people

about changes in the river and detecting bacteria in sewage. I assigned pairs to one test only; that way a few tins go quite far, and the learners have enough time to master the test. While I would have simply demonstrated one or two tests to the Grade 5s, for the sake of progression the Grade 6 learners had to do the range of tests themselves. I had to assess them on their ability to do a test and report and interpret their findings. This assessment goes towards their progress in LO1, AS 2: *Conduct simple tests and record observations* and AS3: *Relate observations to the focus question.*

The learners enjoyed working at the river, especially those who find book-based enquiries difficult. But when all the pairs had reported their findings in class, and I helped them to make sense of their data, they were upset that our local ecosystem was so badly damaged. There was little sign of any water life, and high levels of faecal coliform contamination. Now they want to trace the course of the river to find out where the sewage pollution comes from; they suspect informal settlements where people don't have toilets; I suspect an overflow from the municipal sewage works.

Previously, we would have done such a further investigation only in an environmental club. Now I can do it as part of the formal curriculum for Grade 6, LO3 (*Understanding interrelationships between science and technology, society and environment*), AS2: *Suggest ways to improve technological processes or products and to minimise negative effects on the environment* and AS3: *Suggest how technological products and services can be made accessible to those presently excluded.* I guess the technology we'll be working with will be toilets or sewage treatments! I'll have to find them some suitable reading on these topics. ... And I must remember to keep assessing the learners against the required standards! I have a feeling they might do well, because of the active learning opportunities in and outside the classroom."



Environment in Social Sciences

In the new curriculum, environment and opportunities for environmental learning appear in all Learning Areas. Based on the vision and values of the South African Constitution, a key curriculum principle is to promote a healthy environment, human rights, social justice and inclusivity. This

principle is reflected in required Learning Outcomes and Assessment Standards, specified contexts and core content, which all support environmental learning. Not surprisingly, therefore, environmental learning must be assessed as part of the formal curriculum.



The Social Sciences is about relationships between people, and between people in the environment, both in the past and today. Its aim is to build an awareness of how we can influence our future, by challenging economic and social inequalities, and taking better care of physical resources. Learners get to know their physical, social and political world, first close to home and then more widely, using enquiry - and interpretation skills and content from History and Geography. They investigate key questions about the interactions between people

and places, how these have changed over time, and what their implications are, in terms of social justice (e.g. the fair or unfair distribution of resources), environmental impacts, and social and environmental conflicts. The Learning Area provides opportunities to explore issues like threats to biodiversity, but also encourages a pride in place, identity and heritage. The exploration of issues always includes positive case studies and considerations of what we can do to reduce or fix the impact of our actions on our environment.

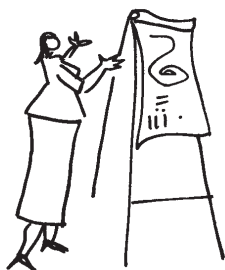


This pamphlet introduces service providers and educators to 'environment' in the Social Sciences curriculum for Grades R-9, and aims to give a sense of how one might work with the curriculum requirements and opportunities. We illustrate some of the many relevant

Learning Outcomes and Assessment Standards and required content. To see where else environmental learning features in the Social Sciences, in other Learning Areas, or in the Grade 10-12 History and Geography curriculum, please consult the National Curriculum Statements.



The Learning Outcomes (LO) Apply to All Grades



History Learning Outcome 2

Historical Knowledge and Understanding

Learners will be able to demonstrate historical knowledge and understanding.

Social Sciences has 2 more LOs for History and 1 more for Geography.

Geography Learning Outcome 2

Geographical Knowledge and Understanding

Learners will be able to demonstrate geographical and environmental knowledge and understanding.

Geography Learning Outcome 3

Exploring Issues

Learners will be able to make informed decisions about social and environmental issues and problems.

Assessment Standards (AS)

Foundation Phase Grades R-3

Our examples are from Grade 3

The first Learning Outcomes deal with Historical and Geographical enquiry skills, respectively.



The Geography Knowledge Focus for Grade 3 includes the concept of pollution and its broad effects, as well as managing waste – concepts of reducing, recycling and re-using.

Grade 3, GLO3, AS1:

Identify one or more pollution issues in a particular context.

Grade 3, GLO3, AS5:

Propose solutions to reduce the pollution problem being investigated.

AS) Change and Progress from Grade to Grade

Intermediate Phase Grades 4-6

Our examples are from Grade 6

The History Knowledge Focus for Grade 6 includes the history of medicine, indigenous medicine and traditional healing.

Grade 6, HLO2, AS2:

Give reasons for and explain the results of key events and changes in more than one context.

Grade 6, HLO2, AS3:

Identify some aspects of society which have changed and some which have stayed the same over time in more than one context.



Grade 6, GLO2, AS3:

Describe some ways in which society has changed the environment.

The Grade 6 Geography Knowledge Focus includes environmental issues: contribution of societies to the loss of biodiversity (disappearing wetlands, soil erosion, deforestation, extinction of plants and animals, etc.); development issues: causes of poverty (disrespect for human rights, environmental destruction, lack of access to resources, unemployment, etc); positive case studies.



Senior Phase Grades 7-9

Our examples are from Grade 9



The Grade 9 Geography Knowledge Focus includes Development issues: approaches to development (including concepts like sustainability); the role of science and technology (including modification of crops, Green Revolution); sustainable use of resources: principles of Agenda 21, our dependence on natural resources, all actions must ensure sustainability and everyone must be actively involved in addressing environmental problems; social and environmental conflicts in SA: comparisons - Africa and elsewhere, power, control and discrimination in access to resources such as land, water; case studies.

Grade 9, GLO2, AS3:

Explain how sustainable development could impact positively on people, places, environments.

Grade 9, GLO3, AS1:

Identify social and environmental conflicts in South Africa and compare with other contexts.

Grade 9, GLO3, AS4:

Make informed decisions about various solutions to social and environmental conflicts.

Stories of Possibilities

Working with the GET Social Sciences Curriculum

A Meadowridge teacher's story: "My background is Geography but in Social Sciences I have to combine this with History. This was quite a challenge, along with the outcomes-based approach and new content of the NCS. But I used what I knew and built on that to extend my range. For example, I asked my contacts in nature conservation for information on the History focus area of traditional knowledge and medicinal use of indigenous plants. I then had to think carefully how to use this content in teaching towards the Learning Outcomes, which requires the learners to use and develop enquiry and interpretation skills – not simply to memorise the information! In the end, I built a trip to the botanical garden into my



learning programme for the year, and during this trip the learners had to investigate key questions I gave them, on the traditional use of plants for medicine. They interviewed a botanist and some of the old gardeners, who still use plants for medicinal purposes themselves. They enjoyed learning to identify some medicinal plants, but this was not for assessment in Social Science. I also found them some additional stories of medicinal plant use from the Northern Province and Zimbabwe, to broaden the scope of the lesson, as is appropriate for Grade 6. But I would have been stuck if I hadn't planned for this in advance, and drawn on the information at the Botanical Gardens".

A Masiphumelele learner's story: "My Grade 9 Social Sciences project is about Cape Point which is in a National Park. We had to do something on how sustainable development can benefit people, places and the environment. I chose Cape Point because we did field work there, so I had a chance to get information, and in earlier grades we learnt about conservation as a land use option. My project shows that Cape Point was once used for mining limestone to build the Castle of Good Hope, and then it was farmed, but it didn't do well as a farm. People used to say the place was godforsaken and good for nothing. But then it was turned into a conservation area and became a



famous tourist attraction which brings in a lot of money for its owners, SANParks, and creates jobs. Some people who used to be unemployed take out unwanted trees there and build footpaths, and my mother has a job cooking for them. So to me it is an example of sustainable development. People can keep visiting Cape Point and paying to see the fynbos and the beautiful scenery, for ever after, and even the baboons have a safe haven. My brother is in Grade 11 and for Geography he also did a project on Cape Point, but he wrote much more than me, and his project also included other examples of ways to conserve the environment".

Environment In Agricultural Sciences

The environment features prominently in the new curriculum for Grades 10 – 12, the Further Education and Training (FET) band. New FET Subjects promote social and environmental justice and human rights, in line with the South African Constitution. These

principles can be seen in the Learning Outcomes and Assessment Standards required by the curriculum, as well as given curriculum contexts, concepts and content. Environmental learning is therefore also assessed as part of the formal curriculum.

Creating an Environment...



...for Sustainable Agriculture

The Subject Agricultural Sciences helps learners to understand and manage a farm that is environmentally sustainable. Applying the principles of social and environmental justice, they learn to use resources like water, soil and biodiversity wisely, to limit the pollution, wastage and poor land use decisions which degrade ecosystems, and to consider the well-being of workers and consumers, as well as national priorities like poverty, food

security and sustainable livelihoods. They learn to access information and to solve problems using agricultural knowledge, technology and legislation. In this way the Subject prepares informed and responsible citizens who can sustainably manage natural resources to produce food and other commodities, as farmers and managers, or in extension, agri-business, horticulture and related careers.



This introductory pamphlet helps service providers and other educators to find and interpret the environmental focus in the Agricultural Sciences curriculum for Grades 10 - 12. It illustrates some of the Learning Outcomes, Assessment Standards, concepts and content relevant

to environmental learning in the Agricultural Sciences, with a special focus on biodiversity. For more on the other relevant content and outcomes in the Agricultural Sciences as well as other Subjects, or the Grade R - 9 curriculum, see the National Curriculum Statements (NCS).



The Learning Outcomes (LO) Apply to All Grades

Assessment Standards (AS)

Grade 10

To teach towards these Grade 10 Assessment Standards, consider the required content on optimum resource utilisation: soil and water control and conservation; water quality; agricultural pollution; soil degradation.

Learning Outcome 1 Investigate and Analyse

The learner must be able to investigate, critically analyse and understand the challenging nature of agriculture in order to plan and solve problems relating to sustainable agriculture.

AS1: Plan and investigate certain aspects related to agriculture.

AS2: Collect, organise, process and evaluate this information in order to solve problems through responsible decision-making using effective communication.

Learning Outcome 2

Sustainable Agricultural Practices

The learner must be able to demonstrate an understanding of the dynamic nature of agricultural knowledge and of the appropriate technology, and to interpret and apply this knowledge to agricultural management practices and systems to ensure a sustainable agricultural environment.



Learning Outcome 4

Interrelated Issues in Agriculture

The learner must be able to demonstrate an understanding of the links between humans and nature and the impact of socio-economic and political issues on natural resources and on sustainable agricultural production.

AS4: Analyse and describe the value of a healthy environment and ecosystem for the healthy functioning of a democratic, productive society.

AS) Change and Progress from Grade to Grade

Grade 11



To teach towards the Grade 11 Assessment Standards, consider the required content on optimum resource utilisation: surveying and planning; water use – irrigation; soil cultivation including mulching; controlled production – including permaculture.

Suggested sustainability issues to consider include the conversion of virgin land to farm land, and the conversion of farm land for other purposes; water tables and water quality; river health; an 'ecological water reserve' in rivers; soil fertility and contamination, the value of protecting biodiversity including natural vegetation.

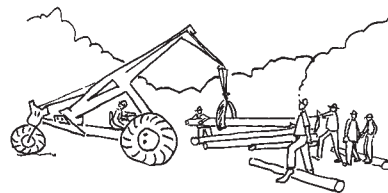
AS5: Investigate and explain sustainable use of agricultural resources to obtain optimum production using different agricultural systems.

The Assessment Standards of Learning Outcome 3 deal with changing agricultural practices and indigenous knowledge ... Look them up, along with others not shown here.

AS5: Demonstrate responsible interpretation of legislation on natural resource utilisation.

This may include legislation on the building of dams; environmental impact assessments related to building new infrastructure or the ploughing of new lands.

Grade 12



AS3: Show responsible handling and use of agricultural equipment according to relevant safety legislation.

Consider contexts like the responsible use of fertilisers, pesticides and herbicides.



AS7: Recognise and analyse a sustainable agricultural enterprise where the system, management and practice do not impact negatively on the environment.

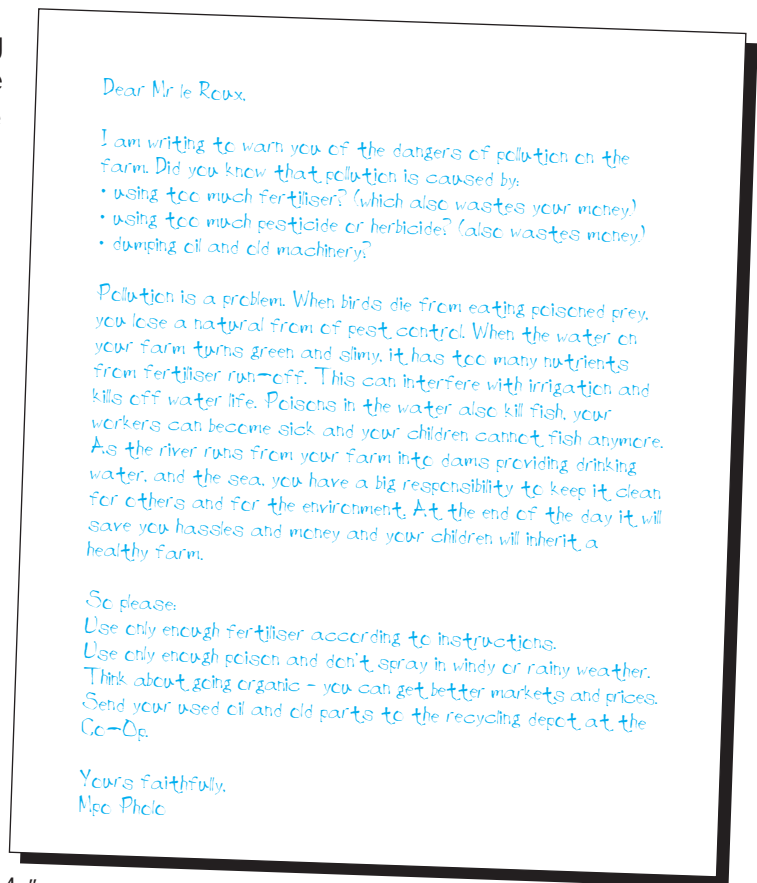
See Grade 11 for suggested sustainability issues; you could consider the positive and negative aspects, economically and ecologically, of using genetically modified seed.



Stories of Possibilities

Working with the FET Agricultural Sciences Curriculum

A teacher's story: "I started teaching Agricultural Sciences this year. I'd like to share two of my lessons. The first was for the Grade 10s, towards LO1, *Investigate and Analyse*, and LO4, *Integrated Issues*. I taught a section from a text book, on agricultural pollution and its impact on natural resources, biodiversity, and the sustainability of farming. Since the Assessment Standard for LO1 requires learners to investigate and interpret information they collect themselves, I set a homework task: they had to contact any farmer they know, and find out how these farmers deal with any the sources of pollution we discussed. In the next period we discussed the information they collected, so that they broadened their knowledge, and I could correct any mis-interpretations. The next activity was to pretend that they were extension officers. They had to write to a farmer (not necessarily a real one) to explain why it is important to prevent agricultural pollution, and what farmers can do to prevent pollution. I used their letters for assessment towards Learning Outcomes 1 and 4."



"The second lesson I'd like to share was for Grade 11. In the first term we did legislation as part of *Interrelated Issues* (Learning Outcome 4). At the end of the term, the learners had to complete the following table, which I then used for

assessment towards Assessment Standard 5: *Demonstrate responsible interpretation of legislation on natural resource utilisation*. The best answers needed extra pages for the last column!"

| The farmer wants to ... | Name one law which the farmer must consider. | What does the law require the farmer to do? | What is your view on the need for this law? |
|--|--|---|---|
| Plough up natural vegetation for a new field | trees on his farm | | |
| Get rid of a leopard which is killing stock | | | |
| Prevent wild fires | | | |
| Build a storage dam | | | |
| Stop the spreading of invasive plants or animals | | | |
| Sell the yellow wood | | | |

Environment in Geography

The environment features prominently in the new curriculum for Grades 10 – 12, the Further Education and Training (FET) band. New FET Subjects promote social and environmental justice and human rights, in line with the South African Constitution. These

principles can be seen in the Learning Outcomes and Assessment Standards required by the curriculum, as well as given curriculum contexts, concepts and content. Environmental learning is therefore also assessed as part of the formal curriculum.



The purpose of Geography is to prepare informed, critical and responsible citizens and decision-makers, who can challenge social and environmental injustices, and make sound decisions as they contribute to the development of society and the physical environment. The Subject involves practical *skills* to investigate people-environment relationships, patterns and processes; related foundational *knowledge* of the changing nature and interrelatedness of human existence and the environment, and the application of knowledge and skills to suggest strategies to address issues. These issues are often complex and not easily solved, and

learners learn to apply principles from concepts like sustainable development, sustainability, democracy and justice, and to recognize the *values*, attitudes and knowledge systems involved. Regional studies provide a framework for understanding the world as a set of interrelated elements that form a system, and thematic studies include an issue-based approach, where learners focus on a specific issue (such as loss of biodiversity) in a particular place or regional context. Career opportunities include eco-tourism, environmental management, water and land affairs, nature conservation and development planning.



This introductory pamphlet helps service providers and other educators to find and interpret the environmental focus in the Geography curriculum for Grades 10-12. It illustrates some of the Learning Outcomes, Assessment Standards, concepts and content relevant

to environmental learning in Geography, with a special focus on biodiversity. For more on the other relevant content and outcomes in Geography as well as other Subjects, or the Grade R-9 curriculum, see the National Curriculum Statements (NCS).



The Learning Outcomes (LO) Apply to All Grades



Learning Outcome 1

Geographical Skills and Techniques

Learners are able to demonstrate a range of geographical skills and techniques.

Learning Outcome 2

Knowledge and Understanding

Learners are able to demonstrate knowledge and understanding of processes and spatial patterns dealing with interactions between humans, and between humans and the environment in space and time.

Learning Outcome 3

Application

Learners are able to apply geographical skills and knowledge to environmental issues and challenges, recognize values and attitudes, and demonstrate the ability to recommend solutions and strategies.

Assessment Standards

Grade 10

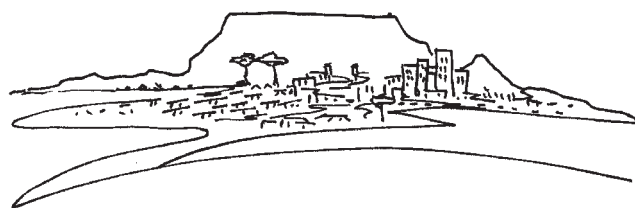
Teach towards these Assessment Standards through exploring: weather systems over Africa and their impact on vegetation and people; impact of people on atmosphere (e.g. global warming); populations movements (e.g. urbanization, migration) and human-environment interactions including population issues, poverty, employment, racism, conflicts, inequalities; among other content and contexts.



Assessment Standards for LO1 not shown here include the skills to use atlases, maps and GIS, and do field work.

AS3: Describe the links between environmental problems and social injustices in a local and global context.

AS4: Describe the interdependence between humans and the environment at different scales.



(AS) Change and Progress from Grade to Grade

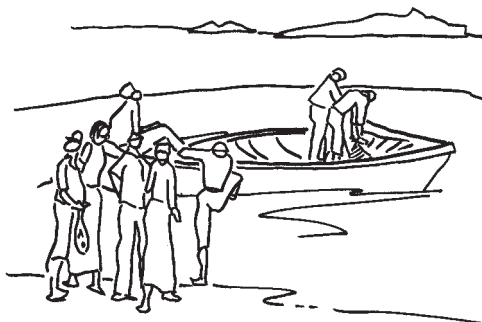
Grade 11

Teach towards these Assessment Standards through exploring: the role of oceans, their exploitation and management; ecosystems and related concepts, processes and interrelationships, human impacts and their consequences, biomes; resource use and management including land use conflict; energy use and management including alternative sources; development and sustainability - models, theories, case studies and strategies to address development problems; among other content and contexts.

AS1: Plan and structure a project or enquiry process.

AS3: Examine issues and challenges arising from human and environment interactions in a local and continental context.

AS4: Explain different measures of conserving the environment while addressing human needs in a variety of contexts.



Grade 12

Teach towards the attainment of these Assessment Standards through exploring: settlement and sustainability issues in urban and rural contexts, e.g. depopulation, sustainable strategies to manage expanding centers or rural depopulation, land reform and redistribution, informal settlements, water as a critical resource in South Africa, its sustainable use and management.

AS2: Integrate information from a variety of sources.

AS3: Explore possible responses to issues and challenges arising from human and environment interactions in a local and national context.



AS1: Apply skills and knowledge to a range of phenomena, issues and challenges at local and national scales.

Stories of Possibilities

Working with the FET Geography Curriculum

A teacher's story: "I set the Grade 12s a project in which they have to answer the question: How can we achieve social and environmental justice in South Africa? This project contributes a big percentage of their mark for the year, and I assess it against a number of Assessment Standards, from Learning Outcome 1 (AS1: *Plan a geographical research project ...*) to Learning Outcome 3 (AS3: *Explore possible responses to issues and challenges ...*). I give them a number of relevant case studies, from which they then select three. They must collect more information about these three, and use field work as well as other sources. Among the case studies I've given

them is the case of an urban reserve which acts as an initiation village, a land claim settlement which promotes organic farming, the employment of convicted poachers to manage local tourism facilities, the introduction of eco-labelling of wine produced on farms which retain some natural vegetation and has fair employment practices, and a number of development applications, for example for a petrol station in a wetland, to grow bio-fuel on a farm which previously produced food, and to build a new dam in a pristine mountain, which would provide water to a big city but reduce the flow to nearby rural areas".

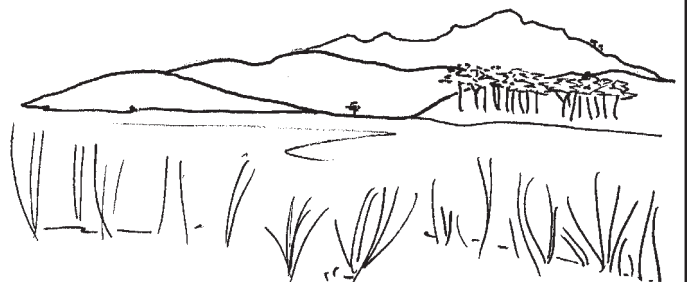
A learner's story: "Geography is my best subject. We don't just talk about how bad everything is, and how people are messing up the world. We actually look at what is being done to do things better, and our teacher gets us to come up with our own solutions, too. We can be creative, but there must be logic to our answers,



and we must have information to back up what we say. It's not easy to find solutions to things like a family struggling to find a space to build a shack on the edge of a nature reserve, but we've learnt that you need to look at big questions, like why people have moved there in the first place, why they cannot make a living where they come from, why other areas of land have already been set aside for up-market housing, and so on. We did some interviews as part of our field work this year, among people living on the edge of a reserve, and others working in it. I like that Geography helps me to see this big picture, and to find out for myself what's going on".

A conservation educator's story: "We work closely with the Geography teachers in our area. They visit the reserve for a big part of their work on biomes and ecosystems, and the related field studies conducted by the learners themselves. I've learnt that we cannot cover concepts like food webs, energy flow and energy flow at the same level that we do with the primary schools! The Grade 11 learners need a much deeper understanding of the concepts, in order to fully understand the impact of inappropriate developments, for example, or alien invasive trees, on ecosystems, and the implications this has for sustainable development and human well-being. They can engage in more abstract thinking than

the little ones, so that's great, but we still provide them with opportunities for hands-on field work, too. Again, this is not just about identifying plants or touching and smelling, but really developing skills like doing transect walks and working with maps, photos and even GIS".



Environment in Life Orientation

The environment features prominently in the new curriculum for Grades 10 – 12, the Further Education and Training (FET) band. New FET Subjects promote social and environmental justice and human rights, in line with the South African Constitution. These

principles can be seen in the Learning Outcomes and Assessment Standards required by the curriculum, as well as given curriculum contexts, concepts and content. Environmental learning is therefore also assessed as part of the formal curriculum.



Life Orientation equips learners with the *skills*, *knowledge* and *values* to respond positively to life's challenges and opportunities, as they get ready to assume their place as active members of society. Responsible citizens take care of their health and relationships; they care about the well-being of others and take appropriate actions to address problems in their environment. When people who are poor or in some other way disadvantaged suffer from environmental issues like pollution, while others benefit, it's an issue of environmental justice. Tackling such injustices requires political literacy –

the ability to act democratically, using laws, policies and relevant channels to exercise our rights and responsibilities. Life Orientation gives learners opportunities to learn these skills and clarify their own values, as they identify social and environmental issues and join others in appropriate activities and services. Relevant issues to explore could be the impact of natural resource loss or land degradation on food security, employment and livelihoods; or threats to biodiversity and human rights caused by insensitive or inappropriate developments.



This introductory pamphlet helps service providers and other educators to find and interpret the environmental focus in the Life Orientation curriculum for Grades 10 - 12. It illustrates some of the Learning Outcomes, Assessment Standards, concepts and content relevant

to environmental learning in Life Orientation, with a special focus on biodiversity. For more on the other relevant content and outcomes in Life Orientation as well as other Subjects, or the Grade R - 9 curriculum, see the National Curriculum Statements (NCS).



The Learning Outcomes (LO) Apply to All Grades



Learning Outcome 1

Personal Well-being

Learners must be able to achieve and maintain personal well-being.

Learning Outcome 2

Citizenship Education

Learners must be able to demonstrate an understanding and appreciation of the values and rights that underpin the Constitution in order to practise responsible citizenship and to enhance social justice and sustainable living.

Learning Outcome 3

Recreation and Physical Well-being

Learners must be able to explore and engage responsibly in recreation and physical activities, to promote well-being.

Learning Outcome 4

Career and Career Choices

Learners must demonstrate self-knowledge and the ability to make informed decisions regarding further study, career fields and career pathing.

Assessment Standards (AS)

Grade 10

Contemporary issues relevant to Life (e.g. ingredients or allergens) to food security, health to invasive alien trees using settlements to choosing clean energy be called specifically 'environmental'.

AS1: Identify social and environmental issues and participate in a group project to address a contemporary social and environmental issue.

AS4: Plan and participate in a self-designed, environmentally responsible outdoors recreational group activity, analysing the value of own participation in such an activity.

AS2: Investigate the diversity of jobs according to economic sectors and work settings and forms of activities in each of these sectors in relation to self.

AS) Change and Progress from Grade to Grade

Grade 11

Grade 12

Orientation can range from the labelling of foods (to identify additives, genetically modified
urity and hunger; from poverty to over-consumption; from air pollution harming children's
g up the water on which people and development depend; from fire hazards in informal
energy sources. While environmental and social issues are often intertwined, an issue can
mental' if it demonstrates the close relationships between people and the natural world.

AS1: Participate in a community service that addresses a contemporary social or environmental issue, indicating how it can harm certain sectors of society more than others.

AS3: Investigate the human and environmental factors that cause ill health, accidents, crises and disasters, and explore appropriate ways to deal with them.

AS1: Evaluate services offered by a community project on a contemporary social or environmental issue, and evaluate own contribution to the project.

These are just some of the relevant **Assessment Standards for Life Orientation** - why don't you look up the others!



AS2: Research the requirements for admission to additional and higher education courses as well as options for financial assistance.

AS2: Explore career opportunities within chosen field and investigate other innovative solutions as ways in which to counteract possible unemployment.

Stories of Possibilities

Working with the FET Life Orientation Curriculum

A teacher's story: "Life Orientation is such an important subject for the FET learner, for so many different reasons. I start the Grade 10s off in the first term with a trip to our local nature reserve. The whole Grade 10 group is there, so it helps them to get to know each other and form good relationships. I also use the opportunity to orientate them to what lies ahead in the last three years of schooling. So I give them time to just interact with each other, and also to reflect alone, perhaps through some creative activity. Some of them will visit the reserve again later in the year for Life Sciences, but learning about biodiversity is not the focus of this particular excursion.

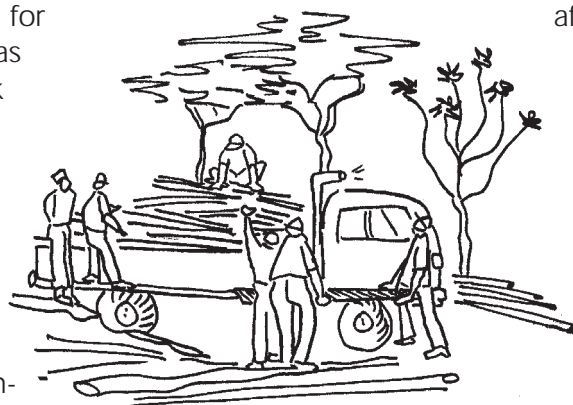
It is however a curriculum-related trip, and I

use the opportunity to address LO3 (*Recreation and Physical Well-being*) through a hike in the reserve. The learners have to plan this activity themselves in groups, and they have to convince me that they've been sensitive to their environmental impact during the hike, in the things they packed, and so on. Afterwards they write an essay about the value of such an exercise for themselves, and I use this essay, as well as my observations during the hike and the planning sessions, to assess them on LO3, Assessment Standard 4: *Plan and participate in a self-designed, environmentally responsible group activity, analysing the value of own participation in such an activity."*



A learners' story: "Last year in Life Orientation, in Grade 11, we joined the Friends of Fynbos to help with hacking alien trees. The idea was to clear a big area of land where these trees have been pushing out the fynbos, and using up water that would otherwise have been there for indigenous plants as well as people. We had to hack every Wednesday afternoon for a whole term; it was a requirement on which we were assessed! But that wasn't all, we also had to do an oral presentation on how invasive alien trees can harm some members of our community more than others. I did think that alien trees can actually help people because they provide building materials and jobs (because some people get employed to clear them, like in Working for Water). But my friend Jo said that poor people suffer a lot from fires fuelled by alien trees. They will also suffer if one day there are so many alien trees using up all

the water and it will cost the government more money to provide water. And the poorest of the poor suffer most when water prices go up. I had to agree with her. You can look for other things to build a house or earn something but you cannot live without affordable water. This year we will continue working with Friends of Fynbos. We don't have to hack any more (yeah!). For Grade 12 we must evaluate the services which the Friends offer in relation to the protection of biodiversity, water, sustainable livelihoods and human well-being, and also our own contribution to the project. Jo and I volunteered to help with awareness-raising, and we'll evaluate that contribution. Our teacher said he'll give us some guidelines on evaluation. I want to be quite critical in my evaluation because I think not enough is being done to replant the areas that have been cleared, with indigenous trees."



Environment in the Life Sciences

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principles can be seen in the Learning Outcomes and Assessment Standards required by the curriculum, as well as given curriculum contexts, concepts and content. Environmental learning is therefore also assessed as part of the formal curriculum.

Life Sciences:



Using Science to Sustain People and Planet!

The Life Sciences Subject prepares learners to apply scientific knowledge in their personal lives and as responsible citizens, in order to develop a healthy lifestyle, and contribute to the sustainable management of resources like water, energy and biodiversity. Progressing from the Natural Sciences Learning Area (Grades R - 9), FET learners who

choose this Subject will explore life processes and interdependence in humans and the natural world in more depth, using scientific inquiry, problem-solving and critical thinking skills. Values and ethics feature prominently, and learners must consider both positive and negative impacts of science and technology on people and nature.



This introductory pamphlet helps service providers and other educators to find and interpret the environmental focus in the Life Sciences curriculum for Grades 10 - 12. It illustrates some of the Learning Outcomes, Assessment Standards, concepts and content relevant

to environmental learning in the Life Sciences, with a special focus on biodiversity. For more on the other relevant content and outcomes in the Life Sciences as well as other Subjects, or the Grade R - 9 curriculum, see the National Curriculum Statements (NCS).



The Learning Outcomes (LO) Apply to All Grades

All the Life Sciences Learning Outcomes are listed here, but only a few of the required **Assessment Standards**, and just some of the specified content and concepts. There is much more!

Learning Outcome 1

Scientific Inquiry and Problem-Solving Skills

Learners are able to confidently explore and investigate phenomena relevant to Life Sciences by using inquiry, problem solving, critical thinking and other skills.

Learning Outcome 2

Construction and Application of Life Sciences Knowledge

Learners are able to access, interpret, construct and use Life Sciences concepts to explain phenomena relevant to Life Sciences.

Learning Outcome 3

Life Sciences, Technology, Environment & Society

Demonstrate an understanding of the nature of science, the influence of ethics and biases in the Life Sciences and the interrelationship of science, technology, indigenous knowledge, the environment and society.



Assessment Standards (AS)

Grade 10

Teach towards these and other Grade 10 Assessment Standards through the specified core knowledge for Grade 10, including biosphere, biomes and ecosystems; natural resources and their management, nutrient cycles and energy flow; human influences on the environment (e.g. introduction of invasive exotic species); local environmental issues; biodiversity and its value for ecosystem functioning and human survival, threats to biodiversity and conservation.

AS3: Analysing, synthesising, evaluating data and communicating findings: Analyse, synthesise, evaluate data and communicate findings.

AS2: Interpreting and making meaning: Identify concepts, principles, laws, theories and models of Life Sciences in everyday life.

AS2: Describe different ways in which resources are used and applied to the development of products, and report on their impact on the environment and society.

Teach towards these and other Assessment Standards through the specified core knowledge for Grade 10, including a boom in an elephant population; drop in fish catch; social behaviour and ethics; the impact of industry (e.g. on endangered species (e.g. in fynbos or renosterveld); wild flowers), sustainability and sustainable development (such as desertification, agriculture, ownership and use of land); not to content to memorise, but topics to investigate

AS) Change and Progress from Grade to Grade

Grade 11

Teach towards these and other Grade 11 Assessment Standards through the specified core knowledge for Grade 11, which includes human influence on the environment (air, land, water); population studies and managing populations (e.g. culling elephants, introducing quotas for fishing).

AS3: Analysing, synthesising, evaluating data and communicating findings: Compare data and construct meaning to explain findings; draw conclusions; assess the value of the process and communicate findings.

AS2: Interpreting and making meaning: Identify, describe and explain concepts, principles, laws, theories and models by illustrating relationships.

AS2: Compare different ways in which resources are used in the development of biotechnological products, and analyse the impacts on the environment and society.

Grade 12

Teach towards these and other Grade 12 Assessment Standards through the specified core knowledge for Grade 12, which includes local environmental issues (e.g. a petrol station to be built on a wetland), and the effects of pollutants on the human body and health (e.g. allergies).

AS3: Analysing, synthesising, evaluating data and communicating findings: Critically analyse, reflect on and evaluate the findings; explain patterns; provide conclusions that show awareness of uncertainty; suggest changes that would improve techniques.

AS2: Interpreting and making meaning: Interpret, organise, compare and evaluate concepts, principles, laws, theories and models and their application in a variety of contexts.

AS2: Analyse and evaluate different ways in which resources are used in the development of biotechnological products, and make informed decisions about their use and management in society for a healthy, sustainable environment.

ds through the specified knowledge which includes, among others: population changes over time (e.g. a nes); historical developments - indigenous knowledge systems, biotechnology, environment, legislation, e.g. acid rain from mining reducing soil fertility and water life); extinction of species, red data listing and eld); exploitation and management of natural resources (like water, soil, abalone, forest products, ment; eco-tourism; rehabilitation (e.g. restoring wetlands or re-planting after alien clearing); land issues use of land) and political, economic, ethical, environmental and other influences on land issues. This refers e and concepts to apply, while learners clarify and develop related values and skills.

Stories of Possibilities

Working with the FET Life Sciences Curriculum

A conservation educator tells this story: “I’m based on a nature reserve. I’ve been running educational programmes for schools and Landcare for some time. This year a teacher asked if we could link the excursion to the Life Sciences curriculum. I was a bit nervous as I don’t have any curriculum background, but together with the teacher I studied the Learning Outcomes, Assessment Standards and specified content for Grade 10. Then we designed an activity, where the learners would audit biodiversity, in order to establish the effect of alien invasive plants like gum trees. They would audit and compare the diversity of plants in an undisturbed part of the reserve, and in an adjacent area invaded by gum trees. We would give them this task in the context of a scientific investigation: we would tell them that the reserve manager wants to remove the gum trees at the picnic site (which is true), and they have been appointed as ecologists who must investigate whether this is a good idea.

When the learners came for their two day excursion, we did a walk on the first morning, so that they could get out and experience the beauty of the place. We spent the second part of the day planning their audits. It’s important that Grade 10s plan the inquiry themselves, with help, as they must learn the necessary skills and will get

assessed on their competence to *plan an inquiry* (Learning Outcome 1). The teacher and I checked their plans while they went for a swim, and afterwards I helped them to improve where necessary while the teacher made notes in her assessment records. The next day the learners conducted their audits, then came back to camp and *interpreted the data* (LO 2). They needed some help with the technical aspects, but they surprised me with the level of discussions which followed. They debated, for example, why gum trees were planted in the first place. While the teacher was again busy with her observation sheets for assessment of interpretations towards LO2, I explained that ideas about biodiversity, land-use and natural resource management have changed over time, partly because our scientific theories changed. I was worried that this discussion ranged too widely, but the teacher was pleased and reminded me that it addressed aspects of Learning Outcome 3.

When the learners submitted their reports a week later, their teacher found that they did well on all the required aspects. She wants to bring these learners back to the reserve in Grade 11, and asked that we develop a new programme around the concept of indigenous knowledge, to complement what she would be teaching in the classroom next year.”

A Grade 12 teacher explains: “The new curriculum is challenging, with its principles of high knowledge, high skills; and social – and environmental justice. But when I heard an interesting talk about genetically modified foods, I realised I could actually teach through this topic – in relation to LO3, the knowledge area Historical developments: indigenous knowledge systems, biotechnology, environment, legislation, social behaviour and ethics. I contacted the speaker and soon I had a lot of information including websites and fact sheets. I taught three lessons on the topic, starting with some samples of Pondoland mealies which are an indigenous example of biotechnology. From there I moved to modern-day genetic engineering of the maize plant. Some maize is genetically modified

to make it resistant to herbicides. This means that farmers can spray these mealies with herbicides to kill weeds. Unfortunately there are negative side-effects, including the possibility of affecting biodiversity and human health. The learners found the topic challenging but interesting, especially because we included ideas on what they can do, e.g. ask that GM foods are labelled so consumers can choose if they want to eat them. They did some follow-up *accessing of information and interpretation*, and put some interesting cartoons in their letters to the food companies! I did need to mediate both the ‘activist’ and the technical information for them, even in Grade 12. I hope service providers will produce more accessible but good quality information on topics such as these.”

And the last word from a Grade 11 learner in Kwazakhele: “This year we had to do a project for population studies in Life Sciences, to come up with a solution to a problem on population management. Mine was on a population boom among

elephants in an enclosed area. The guys at Addo National Park let me work with them. I’ve become so interested! I want to apply at UPE to study further in Life Sciences, maybe Marine Biology or Environmental Science.”



LOCAL ACTION AND LEARNING FOR SUSTAINABLE LIVING

ACKNOWLEDGMENTS

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