

Introductory  
**Core Text**

'A healthy environment' means different things to different people. Similarly, environmental issues manifest differently depending on the context. To adequately understand the features, causes and effects of environmental issues, and to respond creatively by developing solutions or alternatives, we need to draw on skills, insights and inspiration from all areas of human endeavour, including the Arts, Humanities, Science and Technology, Economics, Management, Philosophy and Spirituality. Even at school we find environmental content in all subjects. In this Fundisa for Change programme we will explore environmental and sustainability content that is pertinent to your particular subject area.

It is important to 'know your subject' well, and particularly the environmental content embedded in your subject. Knowledge on its own, however, is not enough, and the creative teacher uses a wide range of methods to mediate learning. And of course, learning needs to be assessed if learner performance and achievement are to be adequately monitored. Finally, it is important to know how to extend the environmental content in your subject so that it makes a practical difference in the life of the school.

The Fundisa for Change programme aims to support you to prepare teachers to engage with environmental and sustainability knowledge and skills in the curriculum, so that they may contribute to building the environmentally sustainable and healthy society that is envisaged in South Africa's Constitution.

### **VERSION 1 – April 2013**

#### **Reference:**

Fundisa for Change Programme 2013. *Introductory Core Text*. Environmental Learning Research Centre, Rhodes University, Grahamstown.

ISBN 978-1-919991-92-4

Printed copies can be ordered from:

Share-Net  
P.O. Box 394, Howick, 3290  
Tel. 033-330 3931  
sharenet@wessa.co.za

#### **Copyright:**

This resource can be reproduced and adapted for research and educational purposes that are not-for-profit, provided the publisher (Fundisa for Change Programme) is duly acknowledged.

Copy-editing: Kim Ward  
Cover design: Francis Lotz  
Layout: Dudu Coelho

# Contents

---

A Changing Environment	2
Building a better world	3
What can we do?	5
Know Your Subject	6
Environment and sustainability in different subjects	6
The environmental knowledge challenge for teachers	7
Using subject-specific units to address the knowledge challenge	9
Improve Your Teaching Practice	10
Good teaching practice	10
Selecting teaching methods for environmental learning	11
Teaching methods and transformative learning	13
Learning theories and teaching methods	13
Expanding the range of teaching methods used in your subject	13
Quality teaching and learning	13
Improve Your Assessment Practice	15
CAPS provides structured guidance for assessment	15
Assessment 'of' learning and assessment 'for' learning	17
Assessment as a process of learning	17
Assessment and the integrity of the discipline	18
Giving feedback	18
CAPS and Whole School Development	19

# A Changing Environment

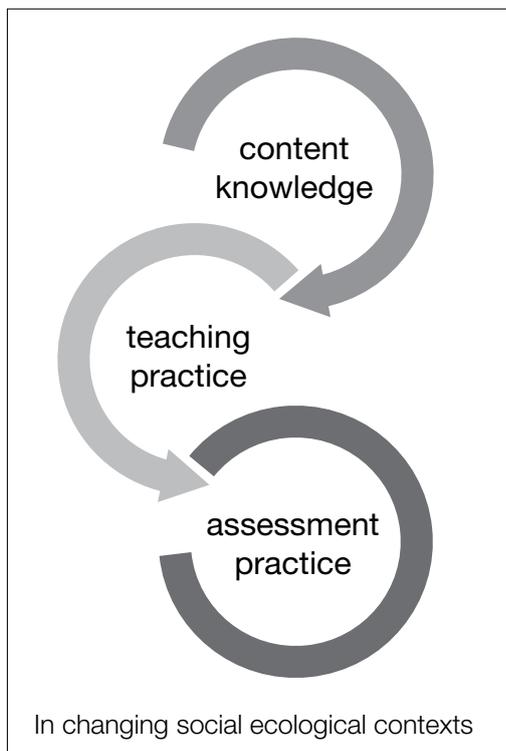
Environment and sustainability are some of the fastest growing topics in school curricula around the world. This is not surprising, as we are all aware that degradation of our environment is one of the really big challenges facing humanity today. As responsible teachers and teacher educators, we need to understand environmental issues better so that we can help children and young people to make sense of our changing world. We need to cultivate in them a sense of hope, as together we explore how to live more sustainably on the Earth.

Like many national curricula around the world, South Africa's new Curriculum and Assessment Policy Statements (CAPS) are rich in 'environment and sustainability' content. Indeed, all the subjects address aspects of sustainability. However, teaching about the environment can be challenging as the issues are complex and much environmental information is new to teachers. This course therefore introduces teachers to relevant knowledge, teaching methods and assessment practices that will enable them to teach the existing environmental content in the CAPS more confidently and successfully.

Did you know?  
In some CAPS Subjects,  
more than 50% of content is  
'environmental'!

The course, which is inspired by the principle of 'building quality teaching and learning' in South African schools, focuses on science, the environment, society and sustainability. It seeks to support the professional development of knowledgeable and skilled teachers who have the capacity, the will and the interest to teach children about the world in which they live, and to equip them to participate successfully both now and in the future. The course develops the knowledge and skills of teachers, enabling them to make reasoned choices about their lives and their teaching. It encourages teachers to develop the values and ethics needed for a more just and sustainable world. It does this through *supporting and extending* the environment and sustainability content, methods and assessment practices that are outlined as a 'minimum' in the CAPS.

The course focuses on enhancing three essential aspects of teaching:



- Knowing your Subject,
- Improving your Teaching Practice, and
- Improving your Assessment Practice.

In addition to this introductory core text, there are several units with specific environmental topics (for example, Biodiversity, Climate Change, Water). The units are phase- and subject-specific, and teachers complete one practice-based assignment that allows them to apply their learning in the context of their subject teaching.

The purpose of each theme-based learning unit is to develop **deep subject knowledge**, with support for **how to teach** and **assess the subject knowledge**.

## ACTIVITY 1

### **GREAT IDEAS FOR ENVIRONMENTAL LEARNING**

Do an Internet search for one of the following terms: 'Environmental Education' or 'Education for Sustainable Development'. Have a look at how much of this kind of work is going on in the world around you. Find and share an example of an interesting educational programme or resource that is relevant to your subject.

### ***Building a better world***

Since the Industrial Revolution began in the late 18<sup>th</sup> century, 'development' has provided humankind with numerous benefits, such as modern medicine, housing, transport and communication systems. However, progress has also caused problems, as non-renewable resources have been over-extracted, huge amounts of waste have been created, and pollution has impacted on the health of people and the environment. Most people are now aware that human actions are changing the climate in unpredictable ways. Societies around the world must 'adapt' and change their practices for a 'low carbon' future. But do most people actually understand what this means?

Massive over-consumption of resources and continued environmental degradation are undermining the natural systems we depend on, and impacting most severely on the poor and marginalised people in our society. How should teachers respond to these challenges? One thing we can do is to give children hope that together we can 'build a better world'. We can use our imaginations and problem-solving skills to creatively develop diverse solutions to our problems, and to change how we live for the better. But do most teachers understand the issues well enough to be able to guide such useful processes?

You can read about the environmental issues confronting South Africa in the annual State of the Environment Report: [http://soer.deat.gov.za/State\\_of\\_the\\_Environment.html](http://soer.deat.gov.za/State_of_the_Environment.html)

What would 'a better world' look like to you? Some of the words people are using to describe this 'better world' – and the ways in which we might build it together – include:

◆ Equity ◆ Sustainability ◆ Resilience ◆ Adaptation ◆ Transformation

## ACTIVITY 2

### **BUILDING A BETTER WORLD**

Find out what each of these words mean.

- ◆ Write your own definition of each word.
- ◆ For each word, give an example of a social practice that expresses the meaning of the word.
- ◆ Explain the relevance of these words for education in general and your subject in particular.

## Ensuring environmental sustainability and social justice in South Africa

---

In developing countries, environmental issues are closely intertwined with development issues. For hundreds of years, due to colonialism and Apartheid, the majority of South Africans were disadvantaged in terms of access to natural resources. They were also disproportionately affected by environmental degradation such as soil erosion and water pollution, and unhealthy living areas and workplaces. These circumstances clearly demonstrated that one's quality of life depends to a large extent on the quality of the environment. Today in South Africa it is generally recognised that issues of environmental sustainability and social justice are closely related and must be considered together.

Consequently with the drafting of the South African Constitution in 1996, the right to a healthy environment was included in the Bill of Rights. The Constitution focuses not only on present generations, but also on future generations, as it commits the country to managing and protecting its natural resources for both present and future generations. This far-sighted agenda has implications for education and training. Indeed, education is central to ensuring that citizens are not exposed to environments that are detrimental to their health or well-being, and that South Africa's natural resources are adequately protected and sustainably used so that they benefit future generations.

In 1998 the South African Government promulgated the National Environmental Management Act (RSA, 1998). This Act provides framework legislation for a wide range of other environmental policies, such as:

- ◆ the new waste policy that promotes an avoidance approach to waste management;
- ◆ the National Biodiversity Act, which makes provision for the protection and sustainable use of South Africa's rich biodiversity;
- ◆ the National Water Act that requires citizens to participate in integrated water resources management.

These policies and laws govern the way in which society is structured, and how activities are managed in workplaces and homes around the country. South Africa's 12 million scholars need to be exposed to the knowledge, skills and values that are necessary to build a just and sustainable society.

Many of these broad policy directions, issues and responses have been translated into curriculum policy. The South African National Curriculum in all its forms (C2005, the NCS and now CAPS) includes a principle that the curriculum should focus on the relationship between a healthy environment, human rights, social justice and inclusivity. It is this principle statement that ensures an environmental focus in all school subjects.

## **What can we do?**

All around the planet, people are working together to build a better world. These people are part of a large-scale international 'environmental movement' that is committed to reversing environmental degradation and improving ecosystem health. The movement includes international institutions (e.g. UNEP and UNESCO), state departments, millions of civil society organisations, and countless individuals.

All these people are helping to re-orientate society towards sustainability in a wide variety of ways. Many new solutions are being proposed, such as renewable energy, water conservation, sustainable agriculture, increased use of public transport, and so on. You will find many such solutions in your own community. You, your family and your school can become part of this growing international movement!

**The Living Planet Index:** The environmental organisation WWF warns that consumption of natural resources and pollution of the environment have been increasing by around 2% per year. Humanity may already have exceeded the sustainable level of fish consumption and carbon dioxide emissions. Earth has lost 30% of its natural wealth in just one generation.

Get inspired! This movement is huge, and it is unstoppable! Watch <http://www.youtube.com/watch?v=N1fiubmOqH4>

### ACTIVITY 3

#### **DOING IT BETTER**

Choose an environmental issue (e.g. water, energy, waste). Look for examples of solutions that people are proposing to address this issue (search the Internet; watch YouTube videos; check the local media).

1. Why are these actions necessary?
2. How do these solutions differ from 'normal practice'?
3. What do they mean for the curriculum and learning in schools and classrooms?

# Know Your Subject

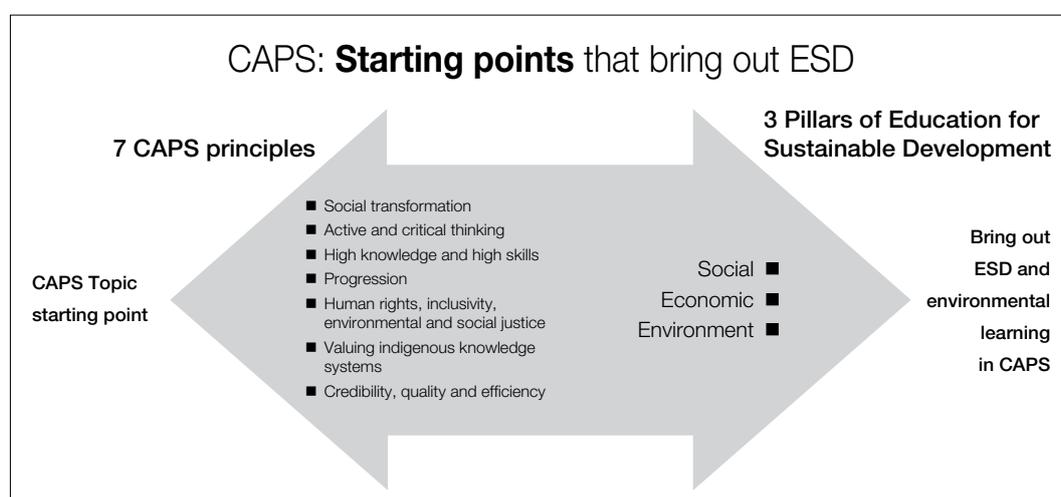
## *Environment and sustainability in different subjects*

The CAPS curriculum is based on a set of important principles. These inform all teaching and learning in the CAPS, and have informed the design and development of all CAPS subjects. These principles are:

1. Social transformation
2. Active and critical learning
3. High knowledge and high skills
4. Progression
5. Human rights, inclusivity, environmental and social justice
6. Valuing indigenous knowledge systems, and
7. Credibility, quality and efficiency

All of these principles are reflected in the objectives of the United Nations Decade of Education for Sustainable Development (ESD). Education for Sustainable Development foregrounds the integration of environment, society and economies for a better life and future for all. Internationally ESD is influencing curriculum development at all levels and phases of the education system, and in South Africa, we can see the influence of new thinking about environment, society and economy in the CAPS curriculum. When we think about environment and sustainability in the subjects, we should try to bring out the curriculum principles and expand on these through thinking about the pillars of ESD as content and processes related to the principles of the curriculum; the pillars of ESD are found in all subjects. The Fundisa for Change programme helps teachers and teacher educators to think about these aspects of the curriculum, and to 'bring out' expanded knowledge and understanding of these important aspects of the curriculum, as found in the subjects. Diagram 1 below suggests that we start by looking at the topics that are contained in the CAPS curriculum, and then think about them through the 'lenses' of the curriculum principles, and relate them to the three pillars of ESD. This can help to develop a coherent way of understanding the environmental and sustainability oriented learning content contained in the different subjects from a national curriculum perspective.

**Diagram 1: Bringing out ESD and environmental learning in CAPS**



Each CAPS subject has an environmental focus, but this focus varies depending on the subject. This is because subjects or disciplines have their own knowledge structures and modes of enquiry or 'ways of knowing'. In these various subjects teachers therefore engage with environment and sustainability content and teaching methods in different ways.

The CAPS is a structured curriculum. In each subject, the minimum content and the sequence in which it should be taught, are specified. Here are some examples of how the environment is **explicitly included** in different subjects:

- **Life Sciences** requires learners to focus on biodiversity. They need to understand life support systems and processes; basic ecological principles; and environmental impacts and how to assess these.
- **Geography** requires learners to understand climate change and (changing) weather patterns; sustainable development principles and practices; urbanisation and land use management and sustainability; management of natural resources, including water; and low carbon energy production solutions.
- **Life Orientation** requires learners to understand environmental health issues and how they relate to personal and social well-being. Nutrition, waste management, food gardening and healthy living practices are also included.

The Fundisa for Change programme focuses on understanding the environmental and sustainability knowledge included in various school subjects. This includes understanding the particular **form** that environmental knowledge takes in different subjects, and why this is so.

In the rest of this section, we consider some important general issues relating to environmental knowledge in the CAPS.

#### ACTIVITY 4

### ENVIRONMENT IN THE CAPS

Go through two or more different CAPS documents. Identify the environment and sustainability content in these documents.

- ◆ What are learners expected to know?
- ◆ How does this content differ from what is included in another subject?
- ◆ What characterises the knowledge in each of the subjects?

## ***The environmental knowledge challenge for teachers***

Research in environmental education shows that few teachers fully understand the environment and sustainability content specified in the curriculum. For many teachers, environment and sustainability knowledge is seen as 'new knowledge'. It is also rapidly changing and developing as scientists strive to understand environmental issues better and come up with possible solutions and alternative practices. For example, 20 years ago little was known about climate change, and even less about alternative energy technologies. Today these

are both rapidly developing areas of new knowledge and practice. Thus, environmental topics represent challenging but ‘real life’ learning opportunities in different subjects.

Particularly with environmental knowledge, teachers face a triple challenge of teaching learners ...

- what we know – content and concepts;
- that what we know can be questioned and changed; and
- that we don’t know everything about these issues.

Now let us explore these and other knowledge-related challenges in greater detail.

### *1. The need for foundational knowledge:*

Environmental issues are generally complex, and understanding them requires an overall appreciation of a number of aspects, from personal and cultural perspectives, to scientific and technical concepts, and political and economic interests. However, this overall ‘birds-eye view’ of an issue is not enough. A certain amount of foundational knowledge in key subjects such as natural sciences and geography is also needed. Without a sound understanding of certain core concepts and processes, it is unlikely that an environmental issue will be adequately understood. This problem can be addressed by focusing on the teaching of **core concepts** and **processes** in various subjects that provide the foundational knowledge necessary to understand a range of environmental issues and possible solutions. Core content includes an understanding of:

- the Earth as a system;
- key life supporting processes; and
- how ecosystems function to support the diversity of life.

#### ACTIVITY 5

### **THE IMPORTANCE OF CORE CONCEPTS**

Work with some of the knowledge resources from your tutor to better understand the three core concepts above. Explain how each of them is relevant to your subject.

### *2. Environmental knowledge is contested and uncertain:*

At school, text books generally present information as unquestioned, cut-and-dried facts. However, the fact that environmental and sustainability knowledge is most often linked to issues means that this knowledge is contested; in other words, people disagree about its validity (truth). For example, despite what many people consider to be convincing evidence that human activities are causing global climate change, large numbers of people believe that the changes we are witnessing are due to natural cycles.

Furthermore, in many cases, we do not know enough about an environmental issue. Our knowledge is incomplete, and thus uncertain. Most teachers and learners are unaccustomed to working with knowledge that is contested or incomplete. Yet this is an important feature of knowledge in the 21<sup>st</sup> century.

### 3. Knowledge progression and quality:

Another issue that needs attention is knowledge progression and quality. Research shows that many teachers are 'under-teaching' learners. This means that not enough attention is being given to the age- and grade-appropriateness and quality of what is taught at different levels. Nor is sufficient attention paid to progression, or how to build on knowledge year by year.

### **Using subject-specific units to address the knowledge challenge**

In the Fundisa for Change programme you will use subject-specific units on particular environmental topics to address the knowledge challenge. You will:

- identify environmental knowledge and concepts that teachers are *supposed* to teach;
- investigate what is known about your topic in terms of content knowledge and key concepts in the curriculum; and
- investigate what is *not known* about the topic, and consider how teachers should teach about incomplete knowledge.

Each teacher will have different environmental content requirements, depending on their particular subject and grade. Throughout the programme teachers will work with their particular curriculum statements and textbooks. In addition, they will use the course units and examples, which will expand and extend their knowledge beyond the minimum requirements of CAPS, with a view to becoming more 'knowledgeable' teachers. Working with all these materials will provide the starting point to explore environmental and sustainability knowledge in the CAPS, and to engage with this knowledge in schools.

#### **What's in each unit?**

In each unit you will find:

- ◆ an overview of a content area that is directly relevant (CAPS links are provided) to the subject you are teaching;
- ◆ a number of additional readings and resources.

The readings will help you to think about environmental knowledge. Some of them are 'factual' and others are 'contested'. Some discuss knowledge-related issues and how knowledge is viewed and used in different subjects.

# Improve Your Teaching Practice

---

## *Good teaching practice*

See the *Methods and Processes* booklet that is part of your course materials for an overview of a range of different methods available to teachers.

'Deliberative methods' involve considering carefully, weighing up reasons for and against, debating. 'Dialogical methods' include discussion and conversation. These two methods have aspects which overlap.

Here we are focusing on the design and implementation of quality teaching and learning processes, or what is often referred to as pedagogy or teaching methodology. At the heart of quality education lies good teaching practice. A number of teaching methods are common to all subjects, but in addition each subject or discipline has its own particular 'embedded methodology' or ways of creating knowledge. For example, the Sciences favour investigative methods; while Life Orientation may favour deliberative methods; and Languages may favour dialogical methods. These disciplinary 'characteristics' influence teaching practice, and have implications for how environmental content is taught and assessed.

Here we consider a variety of teaching methods or forms of learning available to teachers:

### *1. Listening with intent:*

This is one of the oldest and most effective forms of learning. Because of its effectiveness, whole education systems have emerged that use this practice, such as lecturing, or sharing knowledge with others through talking or presenting, and learning through listening). The lecture method and question-and-answer methods often used in schools are based on this form of learning. Teachers give lectures, and then ask learners questions to see if they have been 'listening with intent'. Learning theorists maintain that listening with intent is a very important form of learning. Successful 'listening with intent' approaches require adequate vocabulary, so that learners can understand what is being said. Vocabulary and listening skills are very important to all learning.

### *2. Reading and writing to learn:*

This learning approach complements vocabulary development and listening with intent. In writing and reading activities learners express the meaning they are making in their own words. This requires complex cognitive processes, and a good understanding of the basic conventions of language and how to manipulate, decode and interpret symbols (e.g. letters of the alphabet, numbers and phonetic combinations). Use of these symbols is 'empty' unless there is socially significant meaning attached to the words. Hence in reading and writing to learn, learning theorists emphasise both the technical aspects of language use and the process of meaning making.

### *3. Using numbers and mathematical concepts:*

Doing calculations and using numbers and mathematical concepts, such as space and time, are important methods for learning more about the world. These skills also need to be developed in ways that facilitate meaning making.

#### ACTIVITY 6

#### **EXAMPLES OF BEST PRACTICE**

Reflect on how well you use the three methods above. In each case, share with a partner examples of 'best practice' from your teaching experience.

#### 4. *Active learning:*

The 1995 White Paper on Education and Training in South Africa stated that environmental education should be integrated into all levels and phases of the education system using an *active* approach to learning. As a result, the CAPS subjects contain environmental content, and require learners to engage actively with complex social and ecological concepts, issues and risks relating to local and global contexts. For example, learners are required to develop understandings of social and ecological change processes, and therefore need to actively conceptualise and prepare themselves for action, or actually engage in action-oriented learning processes. These processes require particular kinds of pedagogical methods and support, which may be unfamiliar to teachers, and which will therefore be developed in the Fundisa for Change programme.

Because active environmental learning tends to respond to unique situations, there are seldom existing lesson plans and educational materials to support the learning process. Teachers are therefore often required to design their own teaching and learning programmes and resources to enable learners to work together to explore and investigate the local environment, while also relating their experiences to the global context.

#### 5. *Developing critical and creative thinking skills:*

Environmental concerns are often complex and contested, so learners need to engage critically with these issues. Teachers therefore need to develop the capacity to design teaching and learning interactions that encourage critical thinking and analysis of topics at different scales and in different contexts. Furthermore, it is challenging to develop solutions to these problems as they require integrated thinking, imagination, and changes in social practices. Teachers need to be able to encourage learners to be creative and to use imagination, so that they can think of and develop new alternatives and solutions to environmental concerns.

### **Selecting teaching methods for environmental learning**

#### 1. *Categories of methods:*

A booklet focusing on methods and processes is a key part of the Fundisa for Change programme and should help teachers to select appropriate methods for teaching the environmental content of their CAPS subjects.

This resource describes a range of different teaching methods. It is important to select methods that are congruent with the particular subject, and that extend the content focus in appropriate ways. For example, fieldwork methods are particularly well suited to Science; interviewing methods might be more appropriate for Life Orientation; and mapwork methods are more useful in Geography. Of course, many methods can be used across subjects and in combination with each other.

'Categories of methods' that are particularly relevant to environmental learning include experiential methods, investigative methods, 'learning by doing' methods, and deliberative methods. These methods can be used in different ways in different subjects, but must always be used so that the integrity of the subject is maintained.



See the *Methods and Processes* booklet for many examples within these different categories.

ACTIVITY 7

**EXPLORING TEACHING METHODS**

Consult the *Methods and Processes* booklet and identify those methods you use

- 1) most often
- 2) sometimes
- 3) hardly ever.

Which of the methods that you seldom use could you use more often in your subject teaching? Explain how and why.

**2. Using diverse teaching methods effectively for environmental learning:**

Because environmental topics and issues are complex, understanding them often requires an appreciation of various subjects or disciplines, and it is therefore difficult to confine these topics to a particular subject. It is also ineffective to use one specific teaching method to investigate environmental topics; it is preferable to use a number of methods in combination. Environmental learning often requires inter-disciplinary, thematic or integrated approaches to teaching and learning. This involves different methods being used in different sequences or combinations, sometimes by a team of teachers. Teachers need to plan carefully to sequence these methods effectively.

ACTIVITY 8

**EVALUATING THE SEQUENCE OF METHODS USED IN A PROGRAMME OF LEARNING**

Identify and list the sequence of teaching methods used in the following example. Which methods were essential to achieving the teacher's intention of teaching the learners about water quality?

*A Grade 7 Geography teacher, teaching the topic of water quality, starts the lesson with a story of a polluted river, which tells how children in the area got sick from drinking polluted water. She then goes on to ask learners to read a section in their textbooks on water quality, as well as on water pollution and its effects. She also gives them an extract from a newspaper article on a pollution spill in the local river that was reported a year before. She then asks learners to read an aerial map showing the catchment to identify the source of the pollution. Following this, she takes learners to the local river and uses water quality test kits to test the quality of the water. After this, she asks learners to write down the results of their water quality testing, and to write a proposal on how the problem can be solved.*

## ***Teaching methods and transformative learning***

Transformative learning is learning that asks questions about why things are the way they are, and supports learners to begin responding to these questions. Transformative learning must be well planned and sequenced. It draws on appropriate content and values, and uses teaching methods in innovative ways to help learners to find solutions to problems, and to develop new social practices. Environmental learning seeks to be transformative, as it promotes change towards a more just and equitable society.

Teaching methods that encourage learners to be aware of values, and to develop and reflect on them, are important for transformative learning. Dealing with values in education is not an easy matter, however. The teacher needs to avoid falling into the trap of either ‘indoctrinating’ learners to a particular way of thinking, or of endorsing an ‘anything goes’ approach to life. Ethical theorists propose that we consider the practical adequacy of our values and ethics in social settings, and how our values and ethics ‘do work’ in our society. For example, an ethic of kindness does important work, as it motivates us to care for other people. It has real effects, and can be seen to be ‘working in the world’.

Practical adequacy refers to how well, in a practical way, our values and ethics work for us and our society.

## ***Learning theories and teaching methods***

All teaching methods are informed by learning theories, which make certain assumptions about how teaching and learning take place. For example, an active learning method assumes that learning takes place through active engagement and learning encounters that are situated in particular places or social settings. This method recognises that learners actively construct knowledge. On the other hand, transmission methods assume that learners learn best through listening attentively to what others are saying. In fact, recent learning theory research shows that both of these assumptions are valid. It is therefore important for teachers to use a variety of teaching methods to expand opportunities for learning.

## ***Expanding the range of teaching methods used in your subject***

In the Fundisa for Change programme we will be choosing, using and reflecting on teaching methods that are most appropriate to particular subjects; the environmental concepts, content and issues; and the context of learning (phase, situation, etc.). Subject-specific units will discuss the types of methods that are most suited to teaching particular environmental topics specified in the CAPS.

## ***Quality teaching and learning***

There is little point in using a teaching method in your subject unless it contributes to effective learning. It is vital that teachers give adequate attention to the quality of both teaching and learning.

The following questions can help you determine if you are ‘teaching with quality’. In each case, explain your answer:

Sustainability: Caring for the environment so that it will be in a good condition for future generations.

Reflexivity is the ability to 'look back' critically at your own ideas and practice, and to change them as a result of this reflection.

Socio-cultural factors are factors such as learners' prior knowledge and experiences; language; culture; histories of learners and the societal context.

Structural factors are factors such as resources; availability of textbooks and relevant learning materials; size of classes; poverty conditions; and structuring of the timetable.

**Efficiency:** Did the lesson go well and was time used wisely?

.....  
.....

**Efficacy:** Did learners learn what they needed to?

.....  
.....

**Sustainability:** Did the lesson promote environmental sustainability?

.....  
.....

**Equity:** Were all learners respected and treated equitably?

.....  
.....

**Relevance:** Was the lesson relevant to the curriculum requirements, the learners and society more broadly?

.....  
.....

**Reflexivity:** Were you as a teacher reflexive in the manner in which you implemented the lesson? Was there evidence that you developed the learners' reflexivity?

.....  
.....

**Socio-cultural factors:** What social-cultural factors shaped the teaching and learning that took place in the lesson? Did these factors contribute to expanded learning?

.....  
.....

**Structural factors:** What structural factors influenced the teaching of the lesson, and how did they influence it?

.....  
.....

Use this quality monitoring instrument to reflect on your practice. How can you do things better next time? How can you improve the quality of the teaching and learning in future?

# Improve Your Assessment Practice

## *CAPS provides structured guidance for assessment*

In the CAPS curriculum there is a strong focus on assessment practices that are clearly defined. Topics to be tested are indicated, and there are practical guidelines for what needs to be assessed, including how many marks to be allocated by when. Assessment in CAPS is both formative and summative.

This structured approach to assessment provides teachers with clear pathways for assessment. The environmental content in the CAPS also needs to be properly assessed. This part of the Fundisa for Change programme therefore supports teachers to develop the insight and skills necessary to ensure high quality and effective assessment practices.

CAPS prescribes three different types of assessment:

- **Tests** – using different types of questions;
- **Examinations** – using different types of questions; and
- **Project-based assessment** – enabling qualitative assessments.

What needs to be assessed is clearly outlined. For example, the annual programme of assessment for Life Sciences is shown below:

### ASSESSMENT REQUIREMENTS FOR LIFE SCIENCES: GRADE 11

4.4.1. PROGRAMME OF FORMAL ASSESSMENT					
FORMAL, RECORDED, SCHOOL-BASED ASSESSMENTS				END-OF-YEAR INTERNAL EXAMINATION 75%	
CONTENT		PRACTICAL		2 WRITTEN EXAMINATIONS (2½ HOURS + 2½ HOURS)	PRACTICAL EXAMINATION (1 HOUR)
<ul style="list-style-type: none"> <li>◆ 4 tests (minimum of 50 marks each)</li> <li>◆ 1 midyear examination (2½ hours, 150 marks)</li> <li>◆ 1 project/assignment (can be done in any term: 100 marks in term 4)</li> <li>◆ Skills are listed under Specific Aims 1 and 3</li> </ul>		A selection of 3 representative practical tasks, which <b>cover the range of skills</b> , must be marked and recorded. (The marks allocated for a practical task should range from 20 to 40.) Range of skills described under Specific Aim 2.		Content, concept, skills across all topics. Knowledge of practical work as well as some of the skills related to practical work must be assessed in the written examination.  <b>80%=60 marks</b>	Practical knowledge and skills.  <b>20%=15 marks</b>
SCHOOL-BASED ASSESSMENT (during the year)				75%	
TERM 1	TERM 2	TERM 3	TERM 4	↓  <b>75%</b>	
<ul style="list-style-type: none"> <li>◆ 1 test</li> <li>◆ 1 selected practical task</li> </ul>	<ul style="list-style-type: none"> <li>◆ 1 test</li> <li>◆ 1 selected practical task</li> <li>◆ Midyear examination</li> </ul>	<ul style="list-style-type: none"> <li>◆ 1 test</li> <li>◆ 1 selected practical task</li> <li>* Environmental studies: fieldwork</li> </ul>	<ul style="list-style-type: none"> <li>◆ 1 test</li> <li>◆ 1 project/assignment</li> </ul>		
<b>25%</b>	<b>25%</b>	<b>25%</b>	<b>25%</b>		
<b>Convert to 25%</b>				<b>75%</b>	

\*This is an example of a project/assignment

This summary shows a mix of formal, recorded, school-based assessments, and end-of-year examinations that enable both formative and summative assessments. Types of assessment include tests, practical tasks (to be selected by teachers), examinations, and environmental studies fieldwork. The proportion of school-based formative assessment decreases towards Grade 12, and the proportion of examination-based assessment increases.

Specific guidance on what, how and when to assess is also provided. For example, for the environmental components of Life Sciences, the CAPS document states that the following assessment is required:

#### PAPER 2

TOPIC	TIME	WEIGHTING	
		%	MARKS
<b>T1</b> ♦ Biodiversity and classification of micro-organisms	3 weeks	<b>20</b>	<b>30</b>
♦ Biodiversity in plants + reproduction	3 weeks	<b>20</b>	<b>30</b>
♦ Biodiversity of animals	2 weeks	<b>13</b>	<b>20</b>
<b>T4</b> ♦ Human impact on the environment: current crises	7 weeks	<b>47</b>	<b>70</b>
<b>TOTALS</b>	<b>15 weeks</b>	<b>100%</b>	<b>150</b>

The weighting per topic must serve as a guideline for teachers and slight deviations in respect of the number of marks allocated to a topic would be acceptable. The purpose of providing the weighting is to ensure that all topics are covered in approximately the correct weighting.

This shows that the weighting of topics has been considered in the assessment mix. The assessments required, and the weightings allocated to various topics in the CAPS documents, have implications for what is taught and the methods used. For example, it is important for learners in Grade 11 to have a good understanding of biodiversity and classification if they are to succeed within this assessment framework. They also have to know about and understand human impact on the environment, as this counts for 70 of the 150 marks in Paper 2, which is mostly dedicated to environmental and sustainability content.

Different levels of thinking skills also need to be tested, and a weighting given to each of these different forms of cognition (see below):

Tests and examinations must cater for a range of cognitive levels. The following is the suggested weighting across the different grades in the FET band:

GRADE	Lower Order (Knowledge/Remembering)	Middle Order (Understanding/Applying)	Higher Order (Analysing/Evaluating/Creating)
<b>10</b>	40%	40%	20%
<b>11</b>	30%	50%	20%
<b>12</b>	25%	50%	25%

Even though CAPS provides very structured guidance on assessment, the teacher still needs to think through assessment carefully, and to develop effective assessment strategies. Good assessment practice greatly enhances the quality of teaching practice, especially if assessment is seen as an important part of the learning process. Good quality assessment provides learners with useful feedback on their progress, and helps teachers to get to know learners and to identify the kind of learning support they need.

#### ACTIVITY 9

### ASSESSMENT OF ENVIRONMENTAL LEARNING IN CAPS

Consult a CAPS statement relevant to your subject / phase / grade. What assessment expectations are relevant to the environmental / sustainability content in that curriculum statement?

Working from these assessment expectations, what is the MINIMUM that learners need to be taught to succeed in these assessments?

It is extremely limiting to teach only to the minimum assessment requirements. What more can you teach learners in relation to the CAPS assessment section you chose to review?

## Assessment ‘of’ learning and assessment ‘for’ learning

CAPS differentiates between two types of assessment. Both are critical for good quality assessment:

*“Assessment for learning” takes note of learners’ needs, and is developmental. It helps learners to improve and progress by informing them of their strengths and weaknesses. When the focus of assessment is on the results of learning, assessment is referred to as “assessment of learning”. Assessment of learning usually takes place at the end of a period of work, such as a topic, term or year. Assessment of learning is typically used for promotion and certification purposes. Both assessment for learning and assessment of learning strategies should be used during the school year. (CAPS, Geography, 2011)*

#### ACTIVITY 10

### ASSESSMENT OF AND FOR LEARNING

Read through the statement from the CAPS above, and explain the difference between assessment ‘of’ and assessment ‘for’ learning.

Which of these forms of assessment do you use regularly? For each category of assessment, share an example of your own ‘best practice’ with a colleague.

## Assessment as a process of learning

Assessment is an integral part of the learning process, and teachers therefore need to integrate assessment into their teaching and learning plans. Environmental learning often requires more active or action-centred, critical, creative and situated approaches to learning. But how are such approaches assessed? Can you assess action-centred learning using both continuous assessment approaches and examination questions? If so, what kind of examination questions should teachers be setting? What kind of continuous assessments can be planned, and how can they best be managed? The CAPS prescribes ‘minimum’ style questions to guide assessment practice (e.g. when setting tests and examinations).

A situated approach considers why something is in a specific position or circumstance.

## ***Assessment and the integrity of the discipline***

CAPS assessments follow the logic or integrity of particular subjects, as the following example from Geography FET shows.

### **4.3.2 Formal assessment requirements for Geography**

Formal assessment in each year of the FET band comprises three formal assessment tasks, two tests and two examinations. Grade 12 includes the external examination as well.

#### **(a) Tasks**

Tasks should cover the geographical content and concepts highlighted in the curriculum. They should include a variety of activities and strategies that assess specific aims and skills. Some examples of formal assessment strategies are listed below. These assessment strategies may form the focus of specific tasks or they may be used together as part of a task:

- ◆ reading and interpreting maps;
- ◆ drawing graphs;
- ◆ labelling diagrams;
- ◆ working with data and doing calculations;
- ◆ analysing photographs and satellite images;

#### ACTIVITY 11

### **ASSESSMENT OF DIFFERENT SUBJECTS**

Take a look at the guidelines for Assessment Tasks in Geography. Compare these with Assessment Tasks in Life Orientation and Life Sciences.

- ◆ How are they similar and how are they different?
- ◆ How do the assessment tasks reflect the 'integrity' of the discipline?
- ◆ What does this mean for how teachers should assess environmental learning in different subjects?

## ***Giving feedback***

Feedback is a critically important dimension of assessment and learning. What kind of feedback is most useful to give in an environmental learning process? Is feedback on individual performance the only kind of feedback, or can teachers provide feedback of a more contextual nature too? In the Fundisa for Change programme we will also consider some examples of 'assessment-in-practice' to work out how to plan for and conduct assessments of environmental learning. We will focus on improving assessment practice in the context of a subject, and its particular environmental topics and content.

Of course it is important to bring all of these elements together in a coherent process of teaching. We need to support learners to gain the necessary knowledge for meaningful participation in activities and assessment processes. It is important therefore to see all of the elements in the Fundisa for Change programme as being integrated in and through teaching practices in classroom contexts.

# CAPS and Whole School Development

---

The main focus of the Fundisa for Change programme is to strengthen and improve the quality of environmental learning in the curriculum. However, for quality environmental learning to take place, the 'hidden' curriculum, or the environment in which learning takes place, also needs attention. Quality teaching for sustainable schools does not only involve the actual pedagogical processes in classrooms. It also involves engaging with the school environment and the school-community context, so that school-based curriculum learning resonates with and extends into the school and its context.

The CAPS documents talk about a 'healthy environment', but it is of little value to learn about a healthy environment in theory if the environment around the classroom is unhealthy. Thus there is potential for many extra-mural or extra-curricular activities that can extend and enrich the classroom-based curriculum learning prescribed by CAPS. For example, if you are preparing excellent environmental lessons in your subject, but the school toilets are in a terrible condition, then there is a contradiction between your teaching and the hidden curriculum or the ethics of practice in the school.

In South Africa a number of organisations support curriculum-based environmental teaching and learning within a broader framework of supporting whole school development. These include the Eco-Schools programme and the SANBI's Greening programme. Other government departments and agencies, such as the Department of Water and Environmental Affairs and SANParks also provide schools with environmental information, support resource conservation projects, and offer environmental excursions. Non-governmental and community-based organisations also support schools and teachers with a wide variety of whole school development activities and curriculum-based programmes.

School managers and teachers need to find ways of integrating these initiatives into whole school development plans, so that environmental activities are integrated into the annual plans of the school.

The Eco-school programme is an international sustainability schools initiative that is active in 51 countries around the world. Eco-Schools were initiated in South Africa in 2003, with WESSA as the implementing agent, and there are over 1000 registered schools on the programme. <http://wessa.org.za/what-we-do/eco-schools.htm>

The SANBI Greening programme aims to enrich and expand biodiversity both in school grounds and in communities. <http://www.sanbi.org/programmes/education>

## ACTIVITY 12

### WHOLE SCHOOL DEVELOPMENT

Identify any local school support programmes in your area. Make a list and discuss with colleagues to see if you can add to each other's lists.

A partnership programme  
for environmental learning  
and teacher education

