Did you know?

- South Africa has passed new legislation on its water usage.
- Approximately 12-14 million South Africans do not have access to safe drinking water and about 21 million South Africans do not have adequate sanitation.

What is the solution?

Activity

Fill in the empty boxes and note down examples of how water can be given to these people who do not have access using the following resources:

<table>
<thead>
<tr>
<th>RAINFALL</th>
<th>DAMS</th>
<th>RIVERS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<tr>
<td></td>
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</tbody>
</table>
Science Education

Activity

Work in groups and attempt to put an action plan together for the steps you will take to prevent water pollution, especially on Table Mountain.

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Did you know?

- South Africa has passed new legislation on its water usage.
- Approximately 12-14 million South Africans do not have access to safe drinking water and about 21 million South Africans do not have adequate sanitation.

**The World and its Water**

About 97.5% of the earth’s surface is covered by salt water. Across the globe, this vast interconnecting body of water is sub-divided into the Atlantic, Arctic, Indian and Pacific Oceans. Within these oceans, a wide variety of habitats supports different species. The earth’s oceans provide a rich, but delicate ecosystem - one that is currently under threat from pollution, over fishing and global warming.

South Africa is rich in natural resources, but not in water. Water is a scarce resource, especially for our poor. Our rainfall is less than 500mm a year with the driest part of the country receiving less than 200mm and the wettest receiving more than 2500mm a year.

There are a few natural rivers and lakes in our country and we largely depend on them for our water. The largest river in our country is the Orange River which flows from the east to the west. Its water comes from sources in the Drakensberg and Maluti mountains.

About half of all South Africa’s rainfall is stored in dams and we have about 550 government dams with a total capacity of more than 37,000 million m$^3$.

**Marine Life**

The Cape Peninsula, as you already know, is the meeting place for the two ocean currents, the cold Benguela and warm Agulhas currents. On top of the mountain we look from viewpoints and we can see False Bay from viewpoint 2. Watching the sharks and whales from this viewpoint is a popular tourist attraction.
**Water Pollution**

Water is an integral part of the mountain. Imagine people were allowed to throw down their rubbish everywhere they walked?

Some common pollutants in our water include fertilizers, metal, sand, silt, toxic waste, litter, hot water and pesticides. You can probably guess that these pollutants affect the natural ecosystems and human health.

**Water Saving**

Water is life! Water is very important to us because we cannot live without it. Because we have so many people in our country, we need more water. In order for us to save on water, we need to look at how we are using water and how we can save water.

We use water for various reasons. Some of these reasons are:
- drinking water
- bathing
- diluting juice water
- making cold drinks
- using the toilet

We can save or recycle by:
1. Switching off taps as soon as you’ve used them.
2. Taking a shower instead of a bath.
3. Using a watering can in the garden instead of watering with a hose or a sprinkler.
4. Wash dishes in a dish of water instead of under a running tap.
5. Turn off the tap when brushing your teeth or washing your hair.

Can you add some more water saving tips?
Activity

1. Identify the Buchu plant. Research its medicinal properties.

2. If you were to identify Table Mountain as a base, draw up a plan of action on one of the following strategies:
   - Agriculture
   - Primary healthcare
   - Saving and Lending
   - Community Development
   - Poverty Alleviation

Use the template below to illustrate your answers. Tick your project.

<table>
<thead>
<tr>
<th>Type of Project</th>
<th>Agriculture</th>
<th>Primary healthcare</th>
<th>Sending and Lending</th>
<th>Community Development</th>
<th>Poverty Alleviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resources</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Did you know?

• Indigenous knowledge is the local knowledge that is unique to a given culture or society. The local government uses it as a basis for local level decision making in agriculture, health care, food preparation, education, natural resource management and a host of other activities in rural communities (Warren, 1991)

• Indigenous knowledge is the information base for a society, which facilitates communication and decision-making. Indigenous information systems are dynamic and are continually influenced by internal creativity and experimentation as well as by contact with external resources. (Flavier et al. 1995:479)

Why is Indigenous Knowledge important?

It allows people to understand their environments and is passed down from generation to generation. It gives us an understanding of our indigenous vegetation that was once an integral part of our mountain. On Table Mountain alien vegetation has taken over previously occupied space of indigenous vegetation. The alien vegetation reproduces freely across our country, drinks our precious groundwater and invades these areas. On Table Mountain an example of indigenous vegetation is the BUCHU plant which has medicinal properties.

Some strategies people employ with their indigenous knowledge for their development include:

• Agriculture
• Ethnic veterinary medicine
• Use and management of natural resources
• Primary health care
• Saving and lending
• Community development
• Poverty alleviation
**Describing the fynbos**

In order to find out your ideas on “fynbos”, imagine you are a “fynbos” detective. Your assignment is to correctly identify “fynbos” as the hero in the crime and be able to justify to a court hearing how you came to your decision.

<table>
<thead>
<tr>
<th>Sketch</th>
<th>Description of Fynbos Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Draw your interpretation of fynbos.</td>
<td>Describe why you feel your plant is hailed as a hero plant. In other words, why is it an important species?</td>
</tr>
</tbody>
</table>
Purpose
In this worksheet, learners identify and locate the most important component in the Cape Floral Kingdom. In the process, learners research what the local government initiatives are to eradicate alien vegetation.

Floral Kingdoms. What is it? Where does biodiversity arise from?

Background
The botanical world is divided into six different regions called Floral Kingdoms. These floral kingdoms cover the world’s landmass. It consists of a concentration and a diversity of flora.

The main type of flora / vegetation on Table Mountain is the “fynbos”. There are 270,000 types of plants on earth. Biodiversity is a collective term meaning the total variety of life on earth. It includes the genetic diversity within species, the variety among species and the range of ecosystems within which life exists and interacts. We also get biodiversity hotspots which is an area of rich biodiversity that faces serious threats to its existence.

A US focus group called Conservation International has produced a map of hotspots on the basis of their plant diversity and the impacts upon them. To be classified as a “hotspot” the area should harbour at least 1,500 plants and they must also have lost more than 70% of original natural vegetation to qualify as a hotspot. Below is a sample of hotspots.
### Identified Hotspots

<table>
<thead>
<tr>
<th>AREA</th>
<th>Original hotspot area (sq.km)</th>
<th>Hotspot area (sq.km)</th>
<th>Protected area (sq.km)</th>
<th>Total plant species</th>
<th>Total terrestrial vertebrate species</th>
<th>Total Vertebrates Under threat</th>
<th>Extinct Species since 1500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cape Floristic Province</td>
<td>74,000</td>
<td>18,000</td>
<td>14,060</td>
<td>8,200</td>
<td>562</td>
<td>15</td>
<td>2</td>
</tr>
<tr>
<td>Guinean Forests Of West Africa</td>
<td>1,265,000</td>
<td>126,500</td>
<td>20,324</td>
<td>9,000</td>
<td>132</td>
<td>70</td>
<td>0</td>
</tr>
<tr>
<td>Central Chile</td>
<td>300,000</td>
<td>90,000</td>
<td>9,167</td>
<td>3,109</td>
<td>335</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Madagascar – Indian Ocean Islands</td>
<td>594,150</td>
<td>59,038</td>
<td>11,548</td>
<td>12,000</td>
<td>987</td>
<td>123</td>
<td>46</td>
</tr>
</tbody>
</table>

### Preparation

1. Allow the learners sufficient time to identify the types of vegetation on Table Mountain.
2. Let learners research where the Cape Floral Kingdom stretches to and from.

### Procedure

1. Summarise information in preparing a handout for class including floral kingdoms, biodiversity, its hotspots, alien and invasive vegetation and how we can control this type of vegetation.
**Activity**

1. Illustrate your role as a learner in identifying one environmental issue. In your illustration give / show a potential solution to your issue. Include terms such as biodegradable and biodiversity.

2. Write a letter to government saying what you think should be done about the human influences on the environment. Suggest ways of how government can help communities combat this problem.
Activity
What is an ecosystem? How do we use ecosystems to sustain our environment?

Purpose
In this worksheet, learners identify and research ways of how to sustain our environment. In this process, learners learn to communicate in a written manner.

Background
An ecosystem is a community of plants, animals and smaller organisms that live, feed, interact and reproduce in the same area or environment. Because some ecosystems are very large, many bird species build their nests in one place, but feed in another area. Similarly some ecosystems are very small such as in a field or in a coral reef in the ocean. Different species are found in each ecosystem, even though the two environments could be found near each other. We encounter serious threats to our environment and some possible solutions. What do humans do that affects our environments? They drop their rubbish and drive cars that pollute the air. This is how ecosystems are affected. Are you aware that the waste from one living thing is always used by another? However, humans are different since their waste is not biodegradable and so it is called pollution. What happens to our rubbish? A lot of our rubbish is dropped and is called litter.

Preparation
1. Ask the learners what they think their school area looked like one million years ago, before there were any humans. Emphasise the roles they can play in making their environment sustainable.
2. What has changed in the area since then?
3. Why has it changed?

Procedure
1. Summarise information in preparing a handout for class including human influence on ecosystems and how to make it better. Include terms such as biodegradable and biodiversity.
2. For the assessment, get learners to write a letter to our government saying what they think should be done, asking what is being done and how they can help.
Local Environmental Issues

Name: ___________________________________________________ Date:_______________________

1. Which issue /s is/are of particular interest to you?

2. Where and how will you collect data?

3. What is your analysis of the whole issue?

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_____________________________________________________________________________________
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4. Discuss your chosen issues in groups and identify solutions.

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5. Propose strategies to create and maintain co-operative living habitats thus ensuring quality of life for man and nature.

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Activity

What are the diverse issues that impact upon the quality of life space environments – nearby and close to home?

Purpose
This worksheet will demonstrate an understanding of how man and nature co-exist. In the process, learners learn to understand skill processes (eg: problem solving, critical thinking, decision making).

Background

How population growth globally is creating serious environmental problems. Why?

Today’s worldwide human population of 6.6 billion is expected to grow to more than billion by 2050. With each new person added to the total population, the competition for finite resources such as food and water increases, the lack of those resources in many parts of the world becomes more deadly, and problems such as global warming become more difficult to solve. Issues that impact upon natural and built environments are destined to destroy our environments in which we live.

Some worrying issues are listed on the Wikipedia website (www. wikipedia.org/wiki/List)

Some identified environmental issues
- Climate Change and global warming
- Biodiversity
- Human Population
- Animal and Nature Conservation
- Ozone depletion
Preparation

1. Learners select an issue of particular interest to them.
2. Learners collect data from print / internet / radio / television resources / magazines / maps.
3. Learners analyse and discuss the chosen issue.
4. Learners propose strategies to create and maintain co-operative living habitats thus ensuring quality of life for man and nature.
5. South African internet sites to visit:
   - www.wikipedia.org
   - www.arc.agric.za
   - www.botsocsa.org.za
   - www.ewt.org.za
   - www.environment.gov.za

Procedure

1. It is critically important that learners, who are tomorrow's decision-makers, be made aware of issues that have an impact on the quality of life, and that they develop the ability to analyse and remedy existing and/or potential problems in the context of social communities.
2. Learners are introduced to several issues (see Grade 11) (pollution, population, habitat, ecosystems, sustainable development, human settlements and renewable resources.)
3. Group learners into small groups and allow them to research a selected issue.
4. Learners use internet web sites, television and radio, cameras, video recorders, camcorders and community resources.
5. Learners use critical thinking, problem solving and decision making in their analysis of issues and suggested solutions.
6. Learners discuss solutions and create powerpoint materials that display proposed strategies.