

FOREWORD

Access to safe drinking water and hygienic sanitation facilities are enshrined in our Constitution as basic human rights. A failure to secure these basic human rights can mean the difference between life and death for the poorest of our communities. Ensuring safe drinking water is not simply a question of providing water infrastructure. Water and sanitation without the right health and hygiene practices may result in water that is not safe to drink, and sanitation that is a threat to our health. 'Water services' are therefore about providing water and sanitation services, which address the health of our communities as well as tackling the cycle of poverty and disease.

Central to safe drinking water, improved health, and poverty reduction is better-managed water, where our water resources are developed, protected, used, conserved and managed sustainably. A holistic approach is needed to avert the vicious cycle of water-related diseases, ill-health and poverty. Fundamental to this approach is developing a vision and understanding in society of sustainable water services and sustainable water resources. This vision of sustainability requires ensuring that our society is empowered with information, knowledge and skills to use water efficiently and wisely, to practice good hygiene habits for healthy living, and to protect our water resources so that they do not become contaminated.

A major initiative towards achieving this vision is the 2020 Vision for Water and Sanitation Education Programme (2020 VFWSEP), which targets learners at schools. This is a collaborative programme between the Department of Water Affairs and Forestry (DWAF) and the Department of Education (DoE). It encourages learners to participate in water resource management, to promote good health and hygiene practices and to identify problems related to water and sanitation in their schools and communities.

It is particularly significant that through the 2020 VFWSEP, water and sanitation issues have now become integrated into the school curriculum, thus ensuring continuity and sustainability of this initiative and ensuring that our children will now learn about these issues from an early stage. We also hope that this programme will stimulate the interest of learners to future career opportunities in the water sector thus addressing the skills shortage in this sector.

The integration of water and sanitation in the school curriculum necessitated the development of curriculum aligned educational resource materials for educators. Consequently, the Department of Water Affairs and Forestry in collaboration with other sector partners developed these resource materials for grades R – 9, and have been tested by 90 educators from the 9 provinces. I am confident that these materials provide excellent inputs for learners and communities about water resource management, water supply and sanitation related issues.

I would like to encourage all learners and educators to become involved in the 2020 Vision for water and Sanitation Education Programme and thereby become involved in critically important issues related to water supply, sanitation and water resource management. These are issues that have serious impacts in terms of health and well being for many communities and your involvement can make a significant difference to the quality of people's lives.

I urge all schools to identify water-and-sanitation related problems such as water leaks, blocked toilets, polluted water, and so on, and to bring these problems to the attention of their local municipalities or the Department of Water Affairs and Forestry in their respective areas.

In order to ensure continuity from Grade R to Grade 12, the Department of Water Affairs and Forestry will also develop educational resource materials for the Further Education and Training (FET) Band.

I would like to express my sincere appreciation to the team who developed the materials and to the educators who tested the resource materials. I have no doubt that your efforts will bear fruit, and instill principles of good water resource management and good hygiene, and ensure that our learners become ambassadors for sustainable water and sanitation services. This will mean better health, longer lives and greater dignity for the poorest of our people. Jointly we will work towards a better education and a better life for all.

Mrs L. Hendricks
MINISTER – DEPARTMENT of WATER AFFAIRS and FORESTRY

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SUMMARY OF MODULES

Topics	LO's (*Main and #integration)	Environmental learning focus
1. Make every drop count	*NS: LO2:AS1 #HL: LO3: AS 9 SS (G): LO1: AS5	South Africa is a water scarce country; we need to ensure that the limited water we receive is harvested to the fullest and conserved as well. This activity imparts knowledge about the relationship between various cloud formations and types of rain they bring. This will ensure that learners can, through looking at the cloud, get ready to harvest as much water to ensure the constant supply and optimum use of this scarce resource.
2. Always use water wisely	*SS (G) LO2: AS 3 #AL: LO 3: AS 6	In this chapter learners gain information about what wetlands are and of what benefit they are to us. In many cases wetlands have been destroyed and riverine vegetation removed, decreasing natural flood control so that the amount and quality of water released by our river catchments is decreasing. Learners therefore explore various ways to take care and show responsibility and respect towards water and the environment for the benefit of the plant and animal life as well as their health and that of others. They learn to appreciate that a clean environment means better life for all and proper care of their catchment areas and water sources is essential.
3. You can be a water inspector	*NS: LO1:AS3 #Maths: LO1:AS9	This is a simple water quantity audit to identify periods of high and low water consumption in the household and thus devise effective water saving solutions that will focus on specific activities that have the potential to consume a lot of water.
4. Money from rivers	*SS (G) LO2: AS2 #EMS: LO1: AS2, LO4: AS2	Learners are exposed to various opportunities of economic development that can be derived from our water resources as a means of improving the quality of life and pushing back the barriers of poverty amongst people living around those resources. Learners will therefore learn that water resources need to be used efficiently and responsibly in order to ensure its sustainability and the consistent development of their societies.
5. We all play a role in the economic cycle	EMS: LO1:AS1,2 # HL LO3: AS8	This lesson aims to promote a responsible and positive attitude concerning the production and consumption of resources by making learners aware that resources like water are scarce and are thus regulated by government. In addition, services like water purification and provision of proper sanitation facilities have to be paid for. It is therefore the responsibility of all citizens not to waste water, but to maintain and use these resources and services in a responsible manner so as to ensure its constant supply at an affordable cost. This will ensure efficiency in the use and management of water.
6. Roles and responsibilities in the management of water resources, sanitation and forestry.	*NS LO1: AS1 #HL LO3: AS4	This is an activity that enriches learners with important knowledge of how to apply for water and sanitation services.

Topics	LO's (*Main and #integration)	Environmental learning focus
7. How Human activity impact on the quality of water?	*SS (G): LO2: AS3 #LO: LO1: AS2	This lesson exposes learners to the ways in which various users become potential polluters of water. This therefore requires effective water quality management of our water resources in order to ensure availability of adequate and good quality water on a sustainable basis.
8. Constructing a hand washing facility	*LO: LO1 AS2 #Tech: LO3: AS2	This lesson emphasises simple and functional methods of reducing the risk of diseases by conveying a message of hand washing and showing learners that it can be easy and accessible to everyone irrespective of availability or non-availability of services like taps with running water. This instils an attitude of letting citizens take action for their personal health and hygiene.
9. Prevention is better than cure	*LO: LO1 AS3 #AL1: LO1 AS2 HL: LO2: AS1, 2	Through cooperative learning, learners learn from each other about causes of various diseases and good hygienic practices, using water and ensuring that consuming good quality water is essential for the prevention of such diseases.
10. Waste can harm us	*LO LO1: AS2 #HL LO3: AS8	The aim of this lesson is to make learners aware that waste can be harmful if not managed properly.
11. Swim where it is safe to do so	*LO LO4: AS5 #HL LO3: AS1 LO5: AS1	This activity aims to conscientise learners about the water safety code and emergency first aid.
12. Value of trees	*NS: LO3 AS 2 #HL LO3: AS9	In this activity learners will investigate the dangers of not protecting trees and also discover activities that are dangerous to trees.
13. Social and economic importance of the forest	*SS (G) LO1:AS1 #HL LO3: AS3 LO5: AS1	Learners will acquire knowledge on both social and economic importance of forests.
14. Laws related to alien invasive plants	*NS: LO3 AS 2 # HL LO3: AS9 LO5: AS1	In this lesson Learners are taught about the Cara laws i.e. Conservation of Agricultural Resources Act. They are engaged in discussions of the position of any invasive alien plant on the school grounds by referring to the map provided.
15. Career Fair	*HL LO3: AS9 # LO LO3: AS6	In this activity learners identify different water-related careers.

Message and guidance to the educator

INTRODUCTION

The purpose of this guide is to help educators to educate children to develop a healthy, mature and responsible attitude towards water and sanitation resource management and basic hygiene practices. The guide also aims to encourage the development of awareness to infections, so that communicable diseases do not infect people. The knowledge and skills gained from this resource pack, combined with values taught in the home, will enable and empower young children to lead healthy lives and become the ambassadors of good hygiene and water conservation. The content and teaching / learning activities are intended to be developmentally appropriate and sequential. It is appropriate that water conservation and sanitation information be infused into the established school curricula areas to ensure a comprehensive approach to health education.

This resource material, therefore, assists with the infusion mentioned above into the existing school curricula.

BACKGROUND INFORMATION

In 1996 the Department of Water Affairs and Forestry Sub – Directorate for Community Development and Environmental Education commissioned the development of the first Resource Pack as part of its commitment to support Environmental Education and Water Conservation linking directly to Outcomes Based Education (OBE). Its ultimate goal was to integrate the 2020 Vision for Water Education and Sanitation Programme into the school curriculum and community development training and capacity building programmes.

However, with the advent of the Department of Education's National Curriculum Statement, it became imperative that the second edition be developed in order to make it easy for the educators to integrate water and sanitation into the school curriculum.

Yet again, the Department of Water Affairs and Forestry, in its pursuit to support all programmes that serve to improve the immediate environment of young children invite all its partners including learners to assist in taking up the challenge of ensuring a better environment through active participation in Environmental Education for sustainable development, so that by the year 2020 the state of the said environment, water conservation and sanitation in South Africa is positively sustained.

ACRONYMS

AC -	Arts and Culture
AL -	English – Home Language
AS -	Assessment Standards
CO -	Critical Outcomes
DO -	Developmental Outcomes
EMS -	Economic and Management Science
HL -	Home Language
IAP -	Invasive Alien Plants
LA -	Learning Area
LO -	Learning Outcomes
LO -	Life Orientation
MATHS -	Mathematics
NS -	Natural Sciences
SS -	Social Sciences
Tech -	Technology

MESSAGE AND GUIDANCE TO THE TEACHER ON INVASIVE ALIEN PLANTS

Introduction to the World of Invasive Alien Plants

Invasive alien plants have a damaging impact on our environment. It is causing billions of Rands of damage to South Africa's economy every year, and are the single biggest threat to our water and biological biodiversity. They intensify the impact of fires and floods and increase soil erosion. Of the estimated 9000 plants introduced to this country, 198 are currently classified as being invasive. It is estimated that these plants cover 10.1 million hectares or about 7 % of the country and the problem is growing at an exponential rate.

The inclusion of invasive alien plant content into the resource is to provide you as the educator with relevant information about the topic and to assist you in educating learners and others about this very serious environmental threat to especially our water sources. The lessons included will also assist you in taking action to adequately respond to the problem.

The lessons on invasive alien plants were developed and implemented by a diverse group of educators during a research project which focused on the development of curriculum aligned invasive alien plant resource materials. The educators were constituted from the three phases (GET band) and supported by curriculum advisors from the Western Cape (EMDC) South Metropole. Sixteen schools with 32 educators were involved in the project. The Working for Water Programme acknowledge the following schools for their contributions:

Primary schools: Hyacinth, Siyazingisa, Huguenot, Levana, St Mary's, Westville, Qingqa Mntwana, Edendale.

Senior Schools: Glendale, Grassdale, Oscar Mpetha, Cedar, Sopumelela, I.D. Mkize, Goodhope Campus, Grassy Park.

For additional information on invasive alien plants you can contact the Working for Water Programme offices. Toll free no. 0800 005376

HOW TO USE THIS GUIDE:

SCOPE AND SEQUENCE:

The scope of this resource pack includes:

- ▣ Water is life
- ▣ Water use efficiency
- ▣ Water quality management
- ▣ Sanitation, health and hygiene
- ▣ Water safety
- ▣ Forestry and invasive alien plants

The sequence of the activities contained in this Resource Pack is graded for **Grade 6** and is aligned to the National Curriculum Statements (NCS).

LAYOUT OF EACH TOPIC:

At the beginning of each topic, learning area/s, learning outcomes and assessment standards attained in that chapter are outlined and are further interpreted in the activities that the learners will achieve in that lesson.

Mostly, each chapter begins with a tuning in activity, which serves to identify existing knowledge or gaps pertaining to the topic and to introduce the learners to the activities of the whole chapter. Please use results of these activities to inform the development of the structure of the main topic.

Finally, a suggestion of what can be assessed during the learning and teaching process has been made and linked to the learning outcomes and assessment standards in that chapter. Other aspects pertaining to assessment have been left entirely to the educators because developers of this module indicate that the choice of what assessment strategies to use is a subjective one. It is unique to each school, grade and depends on the educator's professional judgment as well as availability of space and resources.

Same applies to time allocation and other aspects such as linking the lessons to the previous or forthcoming lessons. Although there are some indications here and there, those aspects can best be catered for in the development of lesson plans, which will again be unique to different circumstances.

TEACHING / LEARNING STRATEGIES:

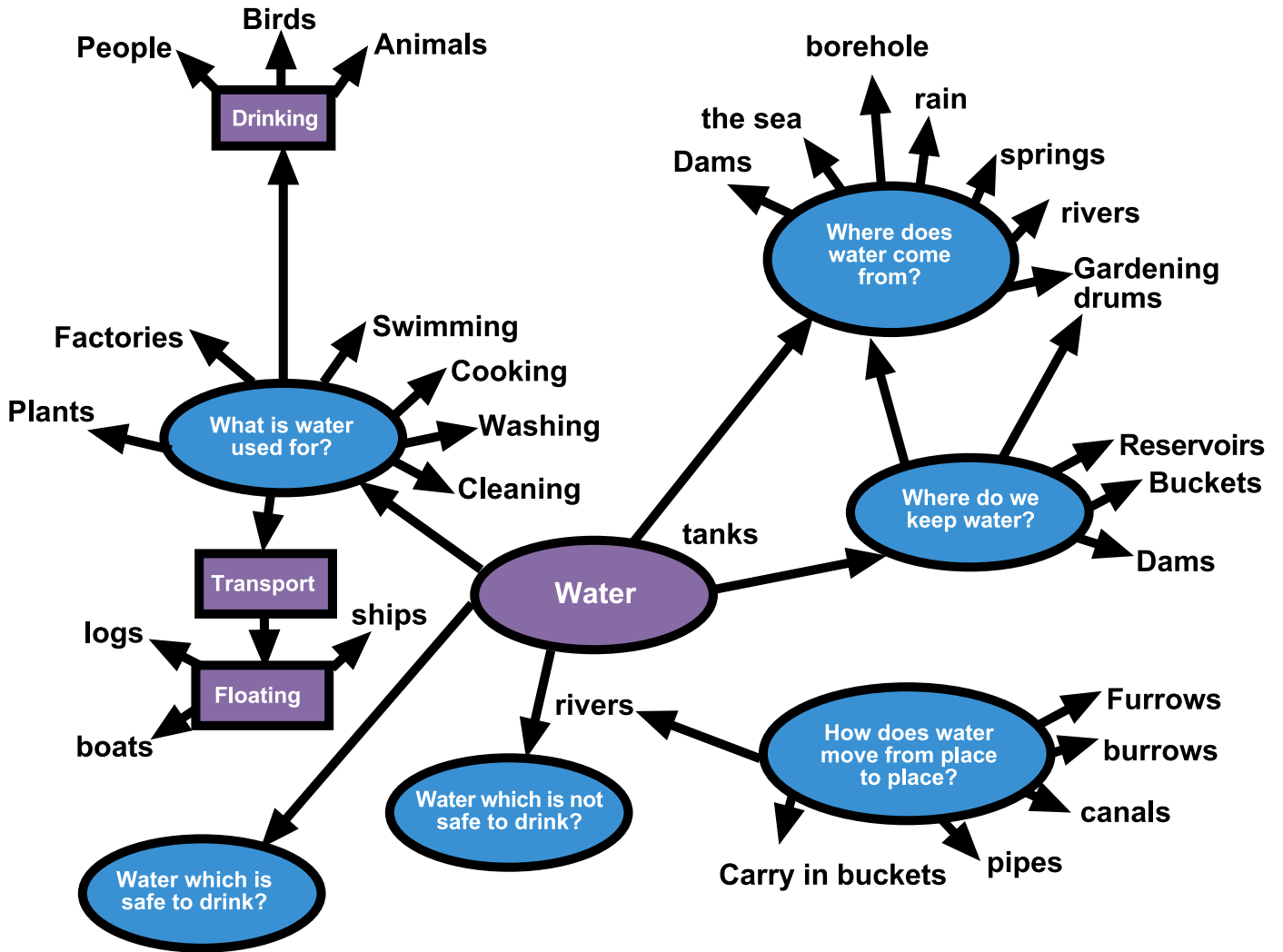
The teaching / learning suggestions in this guide are meant to serve as guidelines, not requirements. In many cases there are many suggestions for activities that will accomplish the same aspects of the outcome.

It is, therefore, not intended that you use all the given strategies. Rather, one or more of the teaching/ learning strategies will be appropriate for a particular grade or situation.

The teaching/learning strategies used in this guide use the current Outcomes Based Education (OBE) methodologies such as:

BRAINSTORMING:

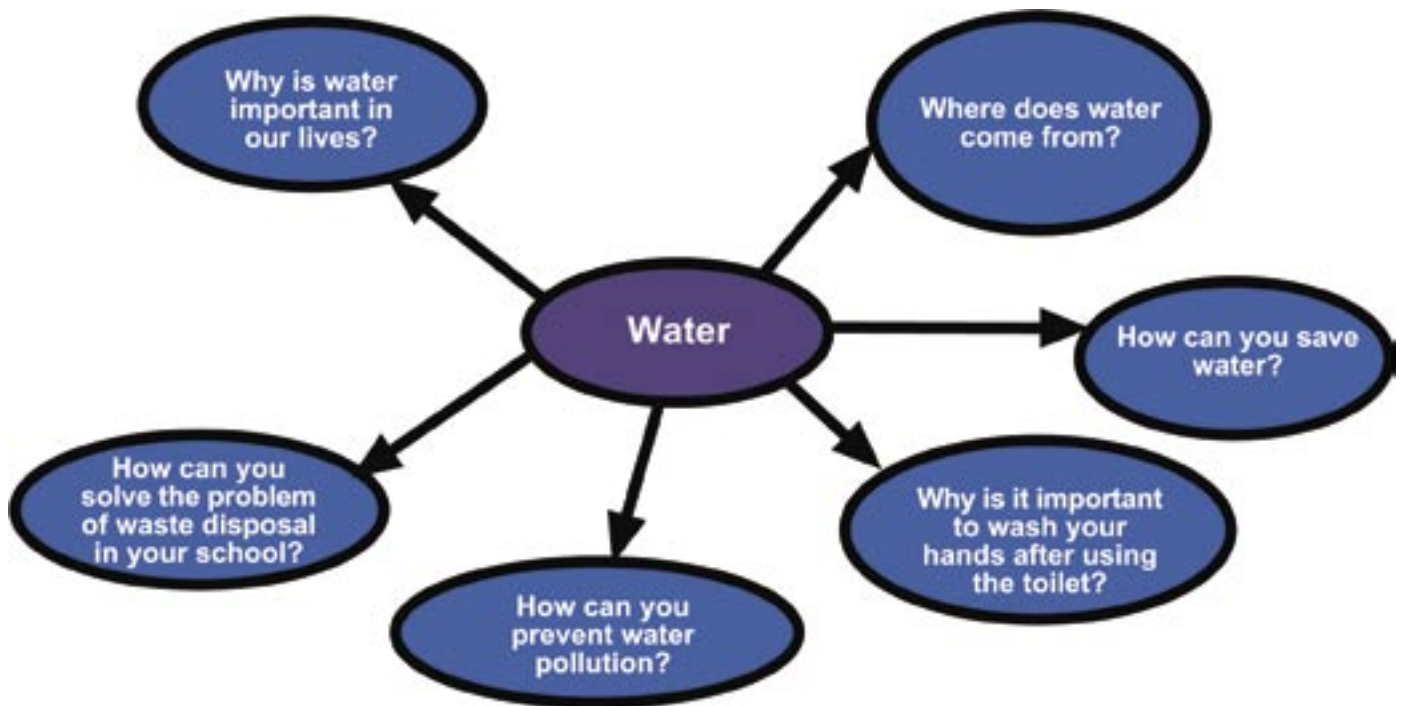
Brainstorming is used to begin discussions or generate a variety of ideas. One of the exemplars of brainstorming methodology is the use of mind / concept map shown below.



CLASS DISCUSSION:

It is used to begin a lesson, to review or to clarify information. For instance, you can use an incomplete mind map to begin a lesson an example of which is shown below.

It is important to realize that there is not only one-way to do mind maps. Different learners will know different things and you should accept these, if they are correct, even if they are not in your mind map.



GROUP DISCUSSION:

This strategy can be used to produce information or to analyse ideas while encouraging interaction among learners in line with group dynamics principles.

ROLE PLAY:

Role-play actively involves learners in learning concepts or practising behaviours in non-threatening situations by acting out an imaginary situation.

HANDS-ON ACTIVITIES:

Use of worksheets, puzzles, and games or other types of written materials to test or review learner's knowledge of a particular topic are especially effective for foundation phase grades.

ASSESSMENT:

In this guide assessment is integrated into the learning and teaching process.

An integrated approach, which assesses both the process of learning and the product of learning, is used here in order to assess holistic learning. This involves:

- ▣ Assessing learners against outcomes and assessment standards, whilst they are working on tasks and activities.
- ▣ Assess learner's investigative, problem solving and co-operative skills.
- ▣ Assessing at the end of learning cycles. This could be a product such as a project or a summative assessment.

**WATER IS
LIFE**

1. MAKE EVERY DROP COUNT



WATER IS LIFE

MAIN LEARNING AREA

NS LO 2: CONSTRUCTING SCIENCE KNOWLEDGE

The learner will be able to know and be able to interpret and apply scientific, technological and environmental knowledge.

AS 1: Recall meaningful information: at the minimum, describes the features, which distinguish one category of thing from another.

Achievement is evident when the learner, for example: describes and names different cloud formations and links them to coming weather.

INTEGRATION WITH OTHER LEARNING AREAS:

HL: LO 3: READING AND VIEWING

The learner will be able to read and view for information and respond critically to the aesthetic, cultural and emotional values in texts.

AS 9: Interprets and analyses independently graphical text and transfers information from one form to another.

SS (G) LO1: GEOGRAPHICAL ENQUIRY

The learners will be able to use enquiry skills to investigate geographical and environmental concepts and processes.

AS 5: Reports on enquiry through discussion, debates, structured writing, graphs, tables, maps and diagrams. (Communicates the answer)

ACTIVITY

Learners will be able to:

- Differentiate between cloud formations.
- Associate the clouds with the type of rain they bring.

GUIDELINES FOR THE CHAPTER:

In this chapter learners will be given information sheets with different cloud formations. They will develop reading and comprehension skills. This chapter will give them the opportunity to critically analyse information and then come up with some conclusions.

WHAT TO DO:

- Establish how much the learners know about the water cycle, as cloud formation is part of the water cycle. Learners must be able to explain the difference between evaporation and condensation.

ACTIVITY 1A: THE DIFFERENCE BETWEEN EVAPORATION AND CONDENSATION

Learners are supposed to read the information sheet individually and then answer the questions that follow.

INFORMATION SHEET: WHY DON'T ALL CLOUDS LOOK ALIKE?

Clouds are main sources of water. Clouds are formed when the sun heats the surface of the earth (moist) and the moisture in the soil evaporates back into the sky. Clouds also condense (come together) to form small drops of water which fall to the ground as rainfall.

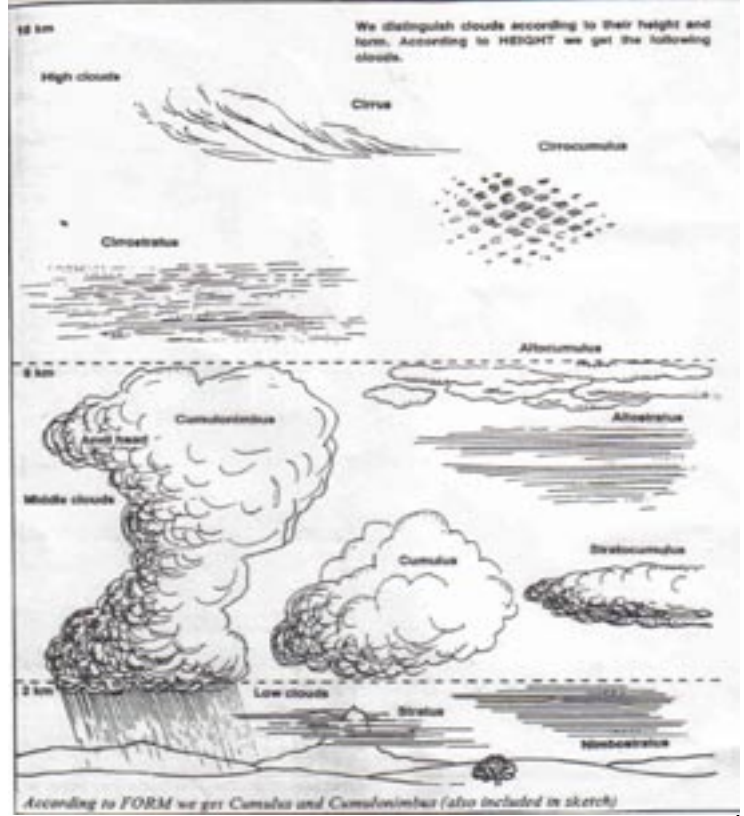
There are many kinds of clouds and each kind has a name. Most clouds are named after their shape.

The clouds that look like great sheets pulled across the sky are called **stratus clouds**. These are the kinds of clouds that are closest to the ground. They form when the layer of warm air rolls over a layer of cooler air. Together they form a thick sheet-like layer.

STRATUS CLOUDS**(look like thin sheets)****CUMULUS CLOUDS****(look like fluffy balls)**

The clouds that are like fluffy balls of cotton wool or scoops of ice cream are called **cumulus clouds**. Cumulus clouds that rise high into the air and grow dark and heavy with rain are the kind of clouds that cause thunderstorms.

The highest clouds of all look like thin wispy streaks or curls. They are so high up in the air, where the air is cold, that they are made up of ice droplets. These clouds are called **cirrus clouds**.

CIRRUS CLOUDS**(are thin and wispy)****DIFFERENT CLOUDS****(in different heights)**

Strato means “sheet like”
 Cumulo means “pile”
 Cirrus means ‘curl’

Did you know? The darker the clouds are, the more thunderstorms and rain we get.

QUESTIONS

1. Ask learners to look at the different cloud formations and tell which one will bring:
 - (a) Light showers?
 - (b) Thunderstorms?

2. According to the information sheet some clouds are at lower levels than others. Which ones are
 - (a) low clouds?
 - (b) high clouds?

3. What is the height of the
 - (a) low clouds?
 - (b) high clouds?

4. According to your own observation the clouds that bring more rain are (dark coloured or light coloured)?

Extension Activity

5. Ask the learners the following questions:
 - On the day you are going to do this task go out and have a look at the sky.
 - (a) What types of clouds are visible?
 - (b) Is there any possibility of rain?
 - (c) If there is a possibility of rain, what preparations have you done to save rainwater in your school?

MEMORANDUM:

1. (a) Cirrus
 (b) Cumulus
2. (a) Status
 (b) Cirrus
3. (a) 2 km
 (b) 16 km
4. Dark coloured.
5. Answers will depend on the type of weather on that day and the area in which you are in.

ASSESSMENT

Assess the achievement after the learners have answered the above questions critically and correctly. Refer to the open-ended memorandum below:

CATEGORIES	Not Achieved (1% - 35%) Level 1	Partially Achieved (36% - 39%) Level 2	Achieved (40% - 69%) Level 3	Outstanding/ Excellent Achievement (70% - 100%) Level 4
Knowledge / Understanding	The Learner:			
• Knowledge of facts and terms	• Demonstrates no or insufficient knowledge of facts and terms	• Demonstrates limited knowledge of facts and terms	• Demonstrates expected knowledge of facts and terms	• Demonstrates thorough knowledge of facts and terms

WATER USE EFFICIENCY



MAIN LEARNING AREA

SS (G) LO 2: GEOGRAPHICAL KNOWLEDGE AND UNDERSTANDING.

The learner will be able to demonstrate geographical and environmental knowledge and understanding.

AS 3: Describes some ways in which society has changed the environment. (People and the environment)

INTEGRATION WITH OTHER LEARNING AREAS:

AL: LO 3: READING AND VIEWING

The learner will be able to read and view for information and respond critically to the aesthetic, cultural and emotional values in texts.

AS 6: Uses reference books and develops vocabulary: uses a dictionary.

ACTIVITY

Learners will be able to:

- Learn more about what wetlands are and how beneficial they are to us.

GUIDELINES FOR THE CHAPTER:

In this chapter learners gain information about what wetlands are and of what benefit they are to us. Similar to the above exercise a variety of ways in which humans pollute water sources and thus contribute to the loss of biodiversity is exposed. In many cases, wetlands have been destroyed and riverine vegetation removed, decreasing natural flood control so that the amount and quality of water released by our river catchments is decreasing. Learners therefore explore various ways to take care and show responsibility and respect towards water and the environment for the benefit of the plant and animal life as well as their health and that of others. They learn to appreciate that a clean environment means better life for all and proper care of their catchment areas and water sources is essential.

Did you know?

Wetlands and their plants are an increasingly popular alternative for filtering wastewater from homes, factories, schools and businesses.

ACTIVITY 2A: WISE UP ON WETLANDS

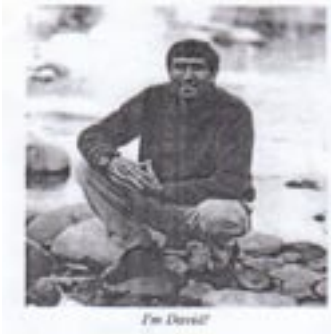
In this activity learners explore the concept of a wetland and learn new words associated with wetlands. They are also orientated on the importance of the wetlands and why it is essential to take care of them.

What should learners do?

Ask learners to:

- Name the sources of water that they know.
- Brainstorm activities by households, farmers, industries, and mines, which can harm the water source.
- Divide themselves into pairs.
- Read the passage and give them some time to answer the questions that follow with their partners. They may use the dictionary for the vocabulary exercise.
- Exchange their books and mark each others work as the whole class provides the correct answers.

WISE UP ON WETLANDS



Hi, I'm David Lindley. I am a conservation ecologist for the Wildlife and Environment Society, working on the Rennies Wetlands Project. I survey and record where our wetlands are, and help to conserve and promote their wise use. I use many neat 4 X 4 vehicles to reach mountain streams and dams on farmlands. I also spend time helping people to map and monitor wetlands. Using a set of booklets called "Wetland Fix" (written as part of my project), I can help farmers and the public to restore and use wetlands wisely.

Why do I work on wetlands?

It is a sad fact that the unsustainable use of land by people is the greatest threat to wetlands today. "Development" has already destroyed more than half our wetland areas, and many cannot be restored. Wetlands play an important role in cleansing, controlling and storing our country's water. We cannot afford to lose more wetlands, and must start fixing and protecting those that are left. Wetlands need our protection!

What is a wetland?

Any land that is wet is a wetland. Wetlands include mountain springs and bogs where rivers start, marshy places, rivers, vleis, lakes, estuaries, the sea shore, even coral reefs. Different wetlands have their own special vegetation types, like reeds and underwater plants. Some wetlands are constantly wet and under water, while others are temporary pans which dry up at certain times of the year. Others are simply areas of waterlogged soil where the water lies just below the surface, e.g. bogs, marshes, and where mountain streams start. About 6 percent of the Earth's surface is covered by wetlands. These areas have a high diversity of plants and animals, and are among the Earth's most productive ecosystems.

The importance of wetlands

- Store water
- Purify water
- Erosion control
- Recreation
- Recharge groundwater
- Regulate floodwater and streams
- Conserve special plants and animals
- Environmental education

David Lindley works for the Wildlife and Environment Society on the Rennies Wetland Project. What have we learnt from his research?

A case study to take you to the wetlands! Source: Envirokids volume 19. Text by Roberta Griffiths.

A) **Vocabulary:** Ask learners to work out the meaning of the following words from the passage or look it up in their dictionaries.

1. Ecologist:

2. Wetlands:

3. Monitor:

4. Restore:

5. Sustainable:

B) What is a Wetland?

C) What is David so concerned about the wetlands?

D) Explain the importance of the wetlands

E) Will knowing more help us to protect the wetlands and change our attitudes? Why?

Assessment

CATEGORIES	Not Achieved (1% - 35%) Level 1	Partially Achieved (30% - 39%) Level 2	Achieved (40% - 69%) Level 3	Outstanding/Excellent Achievement (70% - 100%) Level 4
Knowledge / Understanding	The Learner:			
• Knowledge of facts and terms	• Demonstrates no or insufficient knowledge of facts and terms	• Demonstrates limited knowledge of facts and terms	• Demonstrates expected knowledge of facts and terms	• Demonstrates thorough knowledge of facts and terms



3. YOU CAN BE A WATER INSPECTOR

MAIN LEARNING AREA

NS: LO1: SCIENTIFIC INVESTIGATION

The learner will be able to act confidently on curiosity about natural phenomena, and to investigate relationships and solve problems in scientific, technological and environmental contexts.

AS 3: Evaluates data and communicates findings: Relates observations and responses to the focus question. Achievement is evident when the learner, for example, points to examples of data which confirm the findings; describes the data collection methods and how data were recorded.

INTEGRATION WITH OTHER LEARNING AREAS:

MATHS: LO1: NUMBERS, OPERATIONS AND RELATIONSHIPS.

The learner will be able to recognise, describe and represent numbers and their relationship, and to count, estimate, calculate and check with competence and confidence in solving problems.

AS 9: Performs mental calculations involving addition and subtraction.

ACTIVITY

Learners will be able to:

- Investigate how much water is used at home, for what purpose.
- Make observations and collect data.
- Confirm findings of the collected data.
- Determine during which time of the day most water is used.

Did you know?

30% of your indoor water is used in flushing the toilets. The average toilet uses 15 to 17 litres per flush, average dish 40 litres per load and the typical shower 40 litres per minute.

You will need:

- a water meter box available at your home
- pencils

GUIDELINES FOR THE CHAPTER

All along we were concentrating on river water, now we have to pay attention to water that we get from taps. Learners have to audit how much water is used at their homes in 24 hours or in a day. Through knowing this, they will be able to determine during which times of the day water is used most in their homes and devise some means of saving it. Learners will develop investigative skills. They will use their critical thinking skills to identify the problem and then suggest some solutions

ACTIVITY 3A: INSPECT THE WATER USED AT HOME

In this activity learners will:

- Investigate how much water is used for what purpose at home.
- Inspect the water use at home in 24 hours.

PREPARATION

- Make sure that learners have: plastic ruler, bathtub with shower, learner's sheet.
- You may begin this activity by discussing with the learners the importance of conserving water.

Procedure

- To facilitate the discussion, ask learners to list the activities they use water for at home.
- They must then estimate how much water they use for this activity. They may not give you the exact figures but a rough estimate.
- Narrow the list down to the activities they have mentioned as having used more water. In their list they might mention a shower and a bath as the two that use more water.
- Ask them to estimate how much water each of the two uses.
- Have the learners measure the amount of water they use when they are taking a shower.

- Engage the learners in the following discussion:
 - Which requires more water, a bath or a shower?
 - Why is it important to measure the water level when there is no person in the bath?
 - What measures could be taken to save water at home?

Extension

- As an extension, learners are expected to extend their horizon of thinking, looking at water conservation method at a broader level.
- They are required to consider ways to enforce people to conserve water in the community and thereby design a poster to depict the rules.
- You may orientate them to design the rules on the following:
 - Use of dirty water
 - Leaks
 - Dripping taps
 - Toilet leaks
 - Flushing the toilets
 - Showering
 - Bathing
 - Washing in running taps
 - Kitchen sink disposal
 - Water pipes
 - Watering lawns
 - Washing cars
 - Fertilisation of lawn
 - Lawn cutting etc.

You may encourage them to come up with other rules.

USING WATER AT HOME

- Why is water important? List all the reasons you can think of to answer this question. Think about the needs of other living things and people.
- Ask learners to copy this blank table in their answer book and then list all the ways they use water at home. Over the next 24 hours, tick the middle column of the table, each time they use water for that purpose. Then add up the total.
- What time of the day or night do they think their household uses the most water?

Purpose	For each time used	Total

ACTIVITY 3B: WHEN DO PEOPLE IN YOUR HOME USE THE MOST WATER?

This is the activity that learners have to carry from their homes. Learners should ask their parents or helper to show them where the water meter is and how to read it. Note that since not all learners have water meters at home, you may let them use the water meter at school or arrange with the municipality to supply you with a dummy water meter reading that you can distribute to learners for them to carry out the exercise.



This activity would give learners best results if it were executed from Friday night through to Saturday night so that you can take all five-meter readings over 24 hours. Encourage learners to do this activity on their own or to ask someone in their household to help them take the readings.

Facilitate the execution of this task by assisting the learners to follow the following steps as illustrated in the worksheet.

1. Take readings at the following times and fill in the number of units shown on the meter each time.

Reading time	Amount of water use (in ml)
Reading 1 at midnight on Friday	
Reading 2 at 6.00 a.m. on Saturday	
Reading 3 at noon on Saturday	
Reading 4 at 6.00 pm on Saturday	
Reading 5 at midnight on Saturday	

- Subtract the number of units in reading 1 from the number of units in reading 5 to get the total **consumption** over 24 hours.
- From the five meter readings you can calculate the water consumption in your household in six hourly periods. Simply subtract one meter reading from the next, like this: Reading 2 – Reading 1 = consumption from midnight on Friday to 6.00 a.m. on Saturday. Do this for each six hour period.

Midnight to 6.00 a.m.:
6.00 am to noon:
Noon to 6.00 p.m.:
6.00 p.m. to midnight:

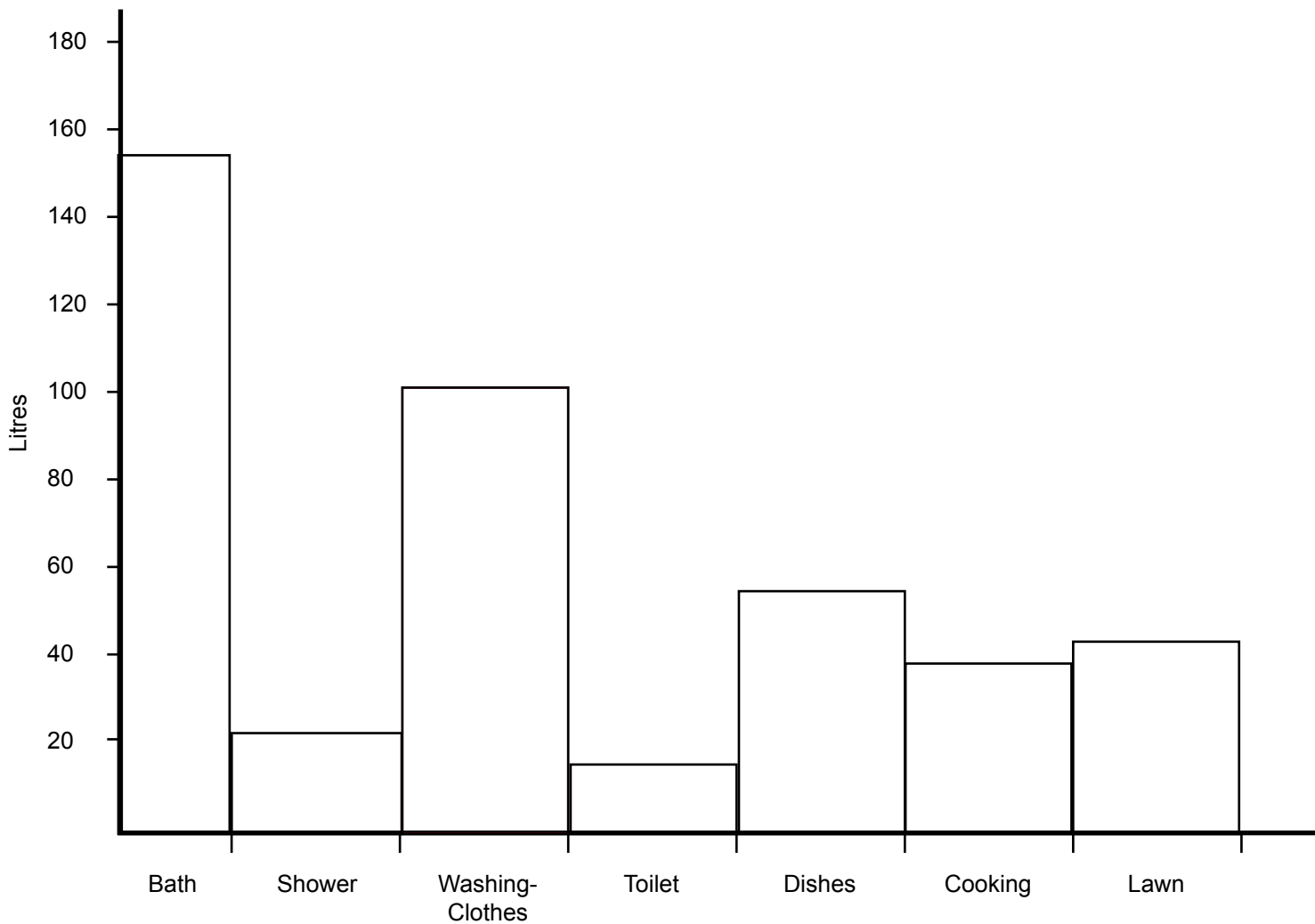
Let the learners answer the following questions:

- Which day did your family use more water?
- What could be the total amount used by your family during the week?
- What is the average amount used by each person in your family?
- Estimate a monthly average of water usage in your family.
- From the findings that the learners obtained from their audit what suggestions can they make to reduce water consumption in their homes?
- Ask learners to make a presentation answering the question: at what time does their household use most water? They must then explain how they have found out the answer.

Extension

This is the activity that predicts the average uses of 800 litres of water per day in a particular home. The information is represented in a table and a graph. Let learners plot and colour the graph.

Water usage	Approximate Litres
Bath	100 -150 litres
Shower	20 litres
Washing clothes	75 – 100 litres
Flushing a toilet	10 -15 litres
Dishwasher	50 litres
Cooking	30 litres
Watering a lawn	40 litres



Questions

1. Which activity uses more water?
2. Which one uses less water?
3. How can we conserve water from the activities that uses more water?

ASSESSMENT

CATEGORIES	Not Achieved (1% - 35%) Level 1	Partially Achieved (36% - 49%) Level 2	Achieved (50% - 69%) Level 3	Outstanding/Excellent Achievement (70% - 100%) Level 4
Synthesis and Application	The Learner:			
• Evaluation and synthesis	• Reaches no or incomplete conclusions based on the evidence	• Reaches some conclusions based on the evidence	• Reaches the expected conclusions based on the evidence	• Reaches informed conclusions based on the evidence
• Transfer of concepts, skills and procedures in new contexts	• Transfers concepts, skills and procedures in new contexts with no limited effectiveness	• Transfers concepts, skills and procedures in new contexts with moderate effectiveness	• Transfers concepts, skills and procedures in new contexts with expected effectiveness	• Transfers concepts, skills and procedures in new contexts with a high degree of effectiveness

4. MONEY FROM THE RIVERS



WATER USE EFFICIENCY

MAIN LEARNING AREA

SS (G) LO 2: GEOGRAPHICAL KNOWLEDGE AND UNDERSTANDING

The learner will be able to demonstrate geographical and environmental knowledge and understanding.

AS 2: Identifies how access to different kinds of resources influences development in different places.

INTEGRATION WITH OTHER LEARNING AREAS:

EMS LO 1: ECONOMIC CYCLE

The learner will be able to demonstrate knowledge and understanding of the economic cycle within the context of 'the economic problem'.

AS 2: Compares the rights and responsibilities of each of the participants in the production and consumption of resources.

EMS: LO4: ENTREPRENEURIAL KNOWLEDGE AND SKILLS

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

AS2: Identifies a variety of possible business opportunities in the community.

ACTIVITY 4A NATURAL RESOURCES THAT ARE OF BENEFIT TO HUMAN ACTIVITIES

ACTIVITY:

Learners will be able to:

- Identify the value of natural resources in boosting the economy and in contributing towards the development of their places.
- Explain how one can earn a living through the use of natural resources available in one's locality.

GUIDELINES FOR THE CHAPTER:

This chapter gives the learners an opportunity to improve their analytic and association skills through analysing pictures and associating them with their everyday lives. They have to develop a positive attitude towards the use of natural resources and know that they can be used to improve the quality of life of the people living around these resources.

WHAT TO DO:

- Ask learners to mention various natural resources that are of benefit to human activities. (They will possibly mention land, water, air, sunlight etc.). Focus on water.
- Allow an open discussion on the concept of renewable and non-renewable resources and how water can be a renewable or a non-renewable resource.
- Ask learners to study each picture in the worksheet critically.
- Column 1 of the worksheet has pictures that show how different communities benefit from the healthy rivers that run along them.
- Ask them to explain in their own words in the opposite column how each community benefits from this important natural resource.

WORKSHEET – QUESTION 1

PICTURE	BENEFIT TO COMMUNITY
	
	
	
	
	

Taken from: Rural Communities and River Health Pamphlet, 2003

QUESTION 2

- Ask them to choose any one of the pictures and brainstorm as many ideas as possible about the type of business opportunity that can be derived from it in order to fight poverty and make money for the local community. In doing so they must take into consideration how these communities that are seen in these pictures can use the resources such that they can last longer or can ensure their sustainability.

For example: What can I do with fish from the river?

Ask them to use the following questions to evaluate each idea and see if it will work or not.

	YES	NO
1. Will this product / service satisfy the needs and wants of potential customers?		
2. Will the business have enough people to buy the product or service?		
3. Do you have or can you train to have knowledge and skills to produce the product / service?		
4. Do you have potential competition in this idea, if so, do you have plans to outsmart your competition?		
5. Do you have resources to carry out this business idea, if not, do you have plans?		
6. Will this business make a profit?		
7. Will this business contribute towards the development of the country / local community?		
8. Is your business idea viable?		
9. Would you like to change it to something else?		

- If they have answered yes to more than 5 of the above questions, that business idea is likely to work, they can accept it. If they have answered no to more than 2 of the above questions, that business idea is not likely to work, reject it.
- Ask each group to choose the best idea amongst the accepted ones and write a paragraph to explain the business idea they have chosen and why. The explanation must be based on the above evaluation questions.

ASSESSMENT:

Assess whether learners:

- Can identify the economic advantage of the river in each picture.
- Can formulate a sound business idea that can contribute towards the development of local communities.

5. WE ALL PLAY A ROLE IN THE ECONOMIC CYCLE!



WATER USE EFFICIENCY

MAIN LEARNING AREA

EMS LO 1: THE ECONOMIC CYCLE

The learner will be able to demonstrate knowledge and understanding of the economic cycle within the context of 'the economic problem'.

AS 1: Describes the roles of households, business and government in the economic cycle.

AS 2: Compares the rights and responsibilities of each of the participants in the production and consumption of resources and services.

INTEGRATION WITH OTHER LEARNING AREAS

HL: LO 3: READING AND VIEWING

The learner will be able to read and view for information and respond critically to the aesthetic, cultural and emotional values in texts.

AS8: Understands and uses information texts appropriately:

B: Selects and records relevant information appropriately.

ACTIVITY

Learners will be able to:

- Differentiate between roles played by the household, government and business in the economic cycle.
- Know why business and households should pay taxes and pay for services provided by the government.
- Know the purpose of using natural resources economically.
- Know the responsibility of each of the above participants in the production and consumption of resources and services.

GUIDELINES TO THIS CHAPTER

In this chapter learners will be able to develop their reading and comprehension skills. They will also be able to analyse a poster and given information. They will know their responsibilities as responsible citizens, government and business towards the use of resources and thus change attitudes and develop positive values concerning the production and consumption of resources and services.

Prior Knowledge

The educator can assess how much learners know about banks & banking. Where does the money in the banks come from (business & households)? Where do banks keep their money? Where does the government keep and gets money?

Introduce them to the Reserve Bank and its functions.

FUNCTIONS OF THE RESERVE BANK

- It is an official bank of government or state.
- Acts as a banker for other banks.
- It stores all the gold and other foreign reserves.
- Controls the amount of money that is in circulation in the country.

ACTIVITY 5A: HOW MONEY, GOODS AND SERVICES FLOW

- Divide learners into pairs.
- Read and discuss the case study with the whole class.
- Ask them to work out the answers in pairs, but every learner must write their answers individually.

ECONOMIC CYCLE

An economic cycle is the flow of money, goods and services between households, businesses, government and the foreign sector.

B. CASE STUDY

Mr X owns a business "HOGSBACK WATERS" where he draws water from the natural spring in the mountain. In doing so he has to abide by the rules and regulations stated by the government as to how many litres of water he is allowed to draw per month. The government through the Department of Water Affairs and Forestry regulates the consumption of water so that it cannot be wasted. During dry seasons the government gives warnings and restrictions so as to save the little water that we have. This water is purified, bottled and sold in local shops. This business provides jobs for the local community as Mr.X employs 70 workers or labourers from various households within the

community (factors of production). This business provides employment and reduces poverty, as the workers are paid wages and salaries. They save some of the money in banks. The banks then save some of the money in the Reserve Bank and then some is issued out to businesses and people in the form of loans. Some of the money in the households is used to buy groceries. When buying groceries a certain amount of money is paid to government in the form of VAT (Value Added Tax). Mr.X also pays tax to the government. The government then saves the money in the Reserve Bank. The money that the government saves in the Reserve Bank is used to provide services to various communities such as clean drinking water at an affordable price provide, accommodation and improved sanitation. The people have to pay for these services so that they can meet the government halfway. It is then the responsibility of each and everyone to save water as an important resource so that it can last longer and to pay for the services provided by the government.

LET'S EXPLORE SOME NEW VOCABULARY!

Enterprise: A business or industry that provides goods and services in exchange for money in order to make a profit.

Factors of production: The four components required to produce goods and services, i.e. capital; natural resources; labour; entrepreneurship.

Households: Families and individuals.

Reserve Bank: Bank where other banks and government keep their money.

Reserves: Assets kept readily available as cash, gold or foreign currency at the Reserve Bank.

Salaries: Monthly payments for labour.

Wages: Weekly payments for labour.

QUESTION 1:

Below is a list of responsibilities of households, business and government. Write down letters A – E and then next to it say whose responsibility it is to supply what is mentioned in the statement.

- A - Provide goods and services.
- B - Pay for goods and services provided.
- C - Pay taxes.
- D - Set rules and regulations governing the use of resources.
- E - Provide for the basic needs of the community.

[More than one answer may be given for one statement – this is acceptable as long as is relevant]

QUESTION 2:

Give an example as it is given in the case study of:

- (a) Services provided by the government to the households.
- (b) Tax paid by individuals in the households.
- (c) Goods provided by the businesses.
- (d) What the households provide to the businesses.
- (e) What the government provides to the businesses.

SUMMATIVE ASSESSMENT

- Refer to the following memorandum for the evidence of the achievement of the learning outcomes:

QUESTION 1

- A - Enterprise/ business
- B - Individuals or households
- C - Households and business
- D - Government
- E - Government

[More than one answer may be given for one statement – this is acceptable as long as is relevant]

QUESTION 2

Give an example as it is given in the case study of

- (a) Water supply
- (b) VAT or Value Added Tax
- (c) Groceries / water
- (d) Labour / workers
- (e) Rules and regulations



Freshwater fishing makes rivers useful in the economy of the country. We need to conserve our rivers for our own economic benefit. Rivers can be important to the economy for several other reasons.

Learners must give one or more reasons why rivers are important for each of the following:

- (a) Farming
- (b) Tourism
- (c) Transport
- (d) Recreation (sport)

Learners should bring the pictures of at least two of the importance uses of water and design a nice poster that shows all the selected important uses of rivers.

ASSESSMENT

The achievement of the learning outcomes will be regarded as achieved when a learner is able to connect the roles and responsibilities of households, business and government towards the economy of the country and the purpose of conserving natural resources for the benefit of the society.

6. ROLES AND RESPONSIBILITIES IN THE MANAGEMENT OF WATER RESOURCES, SANITATION AND FORESTRY



MAIN LEARNING AREAS

NS LO1: GEOGRAPHIC ENQUIRY

The learner will be able to use enquiry skills to investigate geographic and environmental concepts and processes.

AS1: Identifies sources of information, including simple statistics, to help answer the question about a social or environmental issue or problem {finds sources}.

INTEGRATION WITH OTHER LEARNING AREAS

HL LO3: READING AND VIEWING

The learner will be able to read and view for information and enjoyment, and respond critically to the aesthetic, cultural and emotional values in texts.

AS4: Selects relevant texts for personal and information needs from a wide variety of sources in the local community and via electronic media (where available).

BACKGROUND INFORMATION

Water and waste services are essential for health and life. They are also essential for business and industries. Efficient provision of these services can help to eradicate poverty and promote economic development.

'Basic water-supply service' means the provision of a basic facility, the sustainable operation of the facility (available for at least 350 days per year and not interrupted for more than 48 consecutive hours per incident) and the communication of good water use, hygiene and related practices. (A basic water supply facility is defined as the infrastructure necessary to provide 25 litres of potable water per person per day within 200 metres of a household and within flow of 10 litres per minute.)

'Basic sanitation service' means the provision of a basic sanitation facility which is easily accessible to a household, the sustainable operation of the facility, including the safe removal of human waste and wastewater from the premises where this is appropriate and necessary, and the communication of good sanitation, hygiene and related practices. (A basic sanitation facility is defined as the infrastructure necessary to provide a sanitation service which is safe, reliable, private, protected from weather, ventilated, keeps smells to the minimum, is easy to keep clean, minimises the risk of the spread of disease carrying flies and pets, and enables safe and appropriate treatment and /or removal of human water and waste - water in an environmentally sound manner.

The term **water services** mean water supply services and/or sanitation services or any part thereof.

Access to safe drinking water is a human right and essential to people's health. Water Services Authorities (WSA's) are required to ensure that drinking water quality complies with national drinking water standards. The primary responsibility for the provision of safe drinking water rests with WSA's. The WSAs have a legal responsibility to:

- Monitor the quality of drinking water provided to consumers.
- Compare the results to national drinking water standards.
- Communicate any health risk to consumers and appropriate authorities.

Water services authorities- (some district municipalities and authorised local municipalities) are responsible for ensuring provision of water services within their area of jurisdiction. Municipalities operate some local water resource infrastructure (such as dams and boreholes) and bulk water schemes, supply water and sanitation to consumers (household, businesses and industries) and operate wastewater collection and treatment systems.

FORESTRY

Forests are integral to the quality of human life and the environment. They provide food, fuel, shelter, clean water, medicine and employment for people. Forests are home to 70% of the world's terrestrial animals and plants. Forests clean the air we breathe, keep sediments from entering rivers, lakes and protect against flooding and erosion. When managed in a sustainable way they continue to supply current and future generations with a wide range of essential ecological, social and economic goods and services. The Department of Water Affairs and Forestry as the custodian of the government for water and forestry in South Africa has to ensure that South Africa's people use water and forests sustainably for the lasting benefit of all and also in a way that will benefit the environment.

ACTIVITY 6A: HOW TO APPLY FOR WATER SERVICES.

This is an activity that enriches learners with an important knowledge of how to apply for water and sanitation services.

ACTIVITY

Learners will be able to:

- Know where a person can apply for water and sanitation.



Learners are given the following procedure to read and understand. They need to respond to some of the questions that are asked in reference to the procedure.

- Report to the councillor.
- Go to the nearest municipality.
- Ask for an application form, fill it in and submit it.
- The municipality will investigate if there is water near your premises.
- If there is water, they will ask you to pay a deposit.
- After the deposit is paid they will come and install a meter with a standpipe with a tap just outside the fence.

POINTS TO NOTE

- The reason why the water meter is outside is to be accessible to council when coming to read the meter for billing purposes.
- It is the responsibility of the owner to put it inside the yard and inside the house using his/her plumber.
- Every month the meter will be read and the bill will be sent to the owner to pay for the water used for the previous month along with any other services the council is providing to the household, e.g. refuse collection, electricity and sewerage. The Municipality will send information by letter to which indicate where you can go when having problems with any of the services the council is providing.
- You can enquire about anything regarding the services, including the account, water problems, sewerage blockages and electricity outages.
- All problems that happen inside your yard are regarded as private problems and you will need to solve it yourself.
- But anything outside your property is a municipal problem; they will solve it at their cost.

Borehole

- For a borehole application the household needs to have the necessary infrastructure for a yard connection.
- Drill a borehole and then go to the nearest Department of Water & Forestry regional offices and register the borehole.

This is the basic process of installing a borehole:

- Assess for underground water availability.
- Drill a borehole to the depth of the water table.
- Install pipes.
- Install pump.



WHAT TO DO?

- Try to visit any local municipality and request some application forms for water and sanitation activities.
- Engage learners in the process of completing the application form and make sure that all the above processes are demonstrated.
- Also make sure that you get hold of the invoices or statements for electricity and water which indicates the charges per consumption rate. Show the learners the kind of service we are paying for and how much each service costs. This will change their attitude particularly with regard to the unwise use of water.
- You may let them estimate how much it will cost that particular family you have chosen per month if the consumption and the rates remain the same. This will make them aware that it cost a lot of money when these important resources are wasted.

WATER QUALITY



7. HOW DOES HUMAN ACTIVITY IMPACT ON THE QUALITY OF WATER?

MAIN LEARNING AREA

SS (G) LO 2: GEOGRAPHICAL KNOWLEDGE AND UNDERSTANDING

The learner will be able to demonstrate geographical and environmental knowledge and understanding.

AS 3: Describe some ways in which society has changed the environment.

INTEGRATION WITH OTHER LEARNING AREA:

LO: LO 1: HEALTH PROMOTION

The learner will be able to make informed decisions regarding personal, community and environmental health.

AS 2: Participating in problem solving activity to address an environmental health issue to formulate environmentally sound choices.

ACTIVITY

Learners will be able to:

- Value rivers, take care of and not pollute them.
- See the dangers created by human beings to the environment and to their own health.
- Exercise care when using rivers and know that they are the sole beneficiaries of those rivers.
- Change their attitude towards littering.

GUIDELINE FOR THE CHAPTER

This chapter will give learners an opportunity to gain knowledge about pollution and how it affects the rivers. They will also develop respect for the environment.

BACKGROUND INFORMATION

POLLUTION is anything that reduces the ability of the environment to support life. It is the poisoning of our LAND, AIR, FRESHWATER AND OCEANS (MARINE POLLUTION).

FORMS OF POLLUTION

1. **WATER/RIVER POLLUTION:** Diseases such as cholera are carried in polluted water and are a major cause of illness and death. **MAIN SOURCES:** sewage – inadequate sanitation; fertilizers from agriculture; silt from agriculture, construction & mining; pesticides from agriculture and health services; toxic metals from industries. Pollutants dissolve in rainwater. Then polluted rainwater drains off underground and pollutes underground water and surface water supply.
2. **MARINE POLLUTION:** The main sources of pollutants in the ocean are oil spills and waste disposal to oceans from coastal towns. Other sources are sewage, fertilisers, plastics and pesticides.
3. **AIR POLLUTION:** Certain industries produce a lot of air pollution, which affects the health of people and the environment. Major air polluters include chemical manufacturing plants, iron and steel plants, cement manufacture, thermal electric power stations, vehicle emissions, burning coal, asbestos dust and chlorofluorocarbon (CFC's) from aerosols, refrigeration and air-conditioning.
4. **LAND POLLUTION:** Solid waste is classified as hazardous (radioactive, pesticides, medical poisons) or non-hazardous (domestic, urban, plastics, industrial and scrap metals)
5. **NOISE POLLUTION:** Sources include: machines from industries, motor vehicles and powerful sound systems.

WHAT TO DO:

Assess how much the learners know about pollution. All forms of pollution need to be mentioned. Then put more emphasis on water / river pollution. Learners are required to give some ideas of how people pollute rivers.

ACTIVITY 7A: ALWAYS KEEP WATER SAFE AND CLEAN

The following pictures illustrate how human activities can pollute rivers and destroy its healthy status. Ask learners to:

- Choose an effect of human activity on the quality of water from those shown below.
- Write it in an appropriate space next to the picture. i.e. match the picture with the appropriate effect.

PICTURE

EFFECT OF HUMAN ACTIVITY



EFFECTS OF HUMAN ACTIVITY TO THE QUALITY OF WATER

- Farming on the river banks and on steep slopes along the river can increase the rate of erosion, thus causing too much sediments (sand and soil) in the river – (gills of fish can be clogged and they will suffocate and die) Secondly, pesticides and fertilisers can wash into the river (fish & humans get sick).
- Cutting of trees along the riverbanks for firewood is a bad practice because it removes indigenous plants that help stabilise the riverbanks and prevent sediments and waste material from entering the river during rainy seasons and floods. (Alien plants invade and grow along the river banks and they consume plenty of water).
- Catching fish with shade nets prevents small fish from escaping through the holes to get a chance to grow and be large so that a constant supply of fish is ensured. (Small fish will remain in the river and breed and grow so that we can have a constant supply).
- Some detergents that we use to wash our clothes contain chemicals that are harmful to aquatic life (fish and insects) in the river. (Fetch water from the river with a bucket and wash your clothes away from the river).
- Waste material (litter thrown into the river) is not only unsightly but also unhealthy. It can cut you or mosquitoes can breed there. (risk of contracting diseases like malaria). Waste such as urine, faeces, dishwashing water, laundry water, bath/shower water from informal settlements where dry on-site systems such as pit toilets are used, can be dangerous to people's health if they are not disposed of carefully.

Adapted from: Rural Communities and River Health, 2003

ASSESSMENT

- Assessment will be done by the educator and also self-assessment as the relevant answers are provided.
- Skills that will be developed are thinking and analysing, as learners are required to analyse the pictures and reach a decision.

PROJECT: ADOPT-A-SPOT

- Learners should study the environment around home or school.
- Let learners identify the spot where there are activities that have a negative impact on water quality and ask them to:
- Form a group (of at least four) and discuss how they are going to protect the identified environment by adopting it.
- They need to present their plan to the teacher and the class on:
 - (a) What is the problem?
 - (b) What are the negative effects identified?
 - (c) How do you plan to protect that spot (activities)?
 - (d) Which stakeholders are to be involved?
 - (e) What resources are needed?

Assess the learners on the following:

- (a) Ability to describe the problem areas.
- (b) Ability to identify negative impacts of human activities on that spot.
- (c) The viability of the plan. How possible is the implementation of the plan?

Glossary of terms

Silt:	The fine sand, soil or mud which is carried along by the river.
Sediment:	Solid materials that settle at the bottom of a liquid, especially earth and pieces of rock that have been carried along and left somewhere by the water, ice or wind.
Sewage:	It is a waste matter such as faeces and dirty water from homes and factories which flows away through sewers.
Pesticides:	Chemicals which farmers spray on their crops to kill harmful insects.
Emission:	Release of gas or radiation into the atmosphere.
Aerosols:	A small container in which liquid such as paint or deodorant, is kept under pressure. If you press a button, the liquid is forced out as spray or foam.
Hazardous:	Something that is dangerous for people's health or safety.
Suffocate:	To kill or die through lack of oxygen, such as by blockage of the air passage.
Aquatic:	Growing or living in water.
Indigenous plants:	Plants that originate or occur naturally in a country or area.

SANITATION, HEALTH AND HYGIENE

8. ALWAYS PROTECT YOURSELF FROM GERMS

MAIN LEARNING AREA

LO 1: HEALTH PROMOTION.

The learner will be able to make informed decisions regarding personal, community and environmental health.

AS 2: Participates in problem solving activity to address an environmentally sound choices and actions.

INTEGRATION WITH OTHER LEARNING AREAS:

TECH: LO 3: TECHNOLOGY, SOCIETY AND THE ENVIRONMENT.

The learner will be able to demonstrate an understanding of the relationships between science, technology, society and the environment.

AS 2: Suggest ways to improve technological products or processes to minimise negative effects on people and /or the health of the environment.

Tech: LO1: TECHNOLOGICAL PROCESSES AND SKILLS

The learner will be able to apply technological processes and skills ethically and responsibly using appropriate information and communication technologies.

AS2: Designs: Suggest and records at least two alternative solutions to the problem, need or opportunity that link clearly to the design brief and to give specifications and constraints (e.g. people, purpose, safety, environmental impact, appearance).

ACTIVITY

Learners will be able to:

- See how easily one can find hand-washing facilities within reach (next to toilets, next to classrooms near the kitchen or dining room).
- Construct a hand washing facility.
- Explore means of improving hygiene.
- Write down environmental effects associated with hand washing facilities.
- See the importance of washing hands.

You will need:

- String/chord/wire.
- Liquid antibacterial soap.
- Empty plastic bottles with airtight lids / nozzles.

BACKGROUND INFORMATION

Most rural communities use pit toilets, which are not flushed. This is due to the fact that water used is a scarce commodity. In most cases pit toilets are situated far away from houses and other facilities, like water, is purely for hygiene purposes. This creates a high risk of contracting diseases since the users do not wash their hands regularly.

PREPARATION FOR THIS LESSON

- Ask learners to start collecting different plastic bottles preferably with a “clip fast nozzle” like Energade or Powerade drinks about a week before the activity. Two litre cooldrink plastic bottles can also be used as they can carry larger quantities of water but the string to hold it must be stronger.
- Learners should be divided into groups’ of about five learners so that they can make the bottle hand washer for the school toilets and classrooms.



ACTIVITY 8A: CONSTRUCTING A HAND WASHING FACILITY

METHOD

1. Ask learners to look at the above picture and devise their own hand washing facility. They can work in groups for this activity.
2. Hang a plastic bottle, preferably one with a clip fast nozzle as shown in the picture.
3. You may use Energade or Powerade plastic bottle, a string or wire to hang your bottle.
4. Hang one next to your classroom for washing hands before eating.
5. Hang one next to the toilet for washing hands after using the toilet.

STEP 1: Pour 1 teaspoon of liquid soap in a small bottle, it may be more for the bigger bottles, and fill it with water.

STEP 2: Devise your own hanging device with a string or wire.

USE:

- Depending on the nozzle type of your bottle it can be clipped and left open so that water can be squeezed out when needed.
- In another variation the nozzle will need to be clipped shut after using.
- The lid should be airtight when closing so that no water evaporates from the bottle.
- If you do not have any liquid soap, a bar soap in a nylon stocking can be used to further encourage good habit to of hand washing.
 - You need to monitor, periodically, how often learners use the device.
 - Tick every time a learner uses the device or place a cross every time the learner does not use the device.

Time	√ - learner uses the device	X – learner does not use the device
8:00		
9:00		
10:00		

ACTIVITY 8B: SPREAD THE WORD

General studies show that most people do not wash their hands after visiting the toilet.

Ask learners to:

1. Brainstorm with their partners about the effects of not washing hands after visiting the toilet.
2. Design a plan that they can use to educate other learners at school and in their community about the importance of washing their hands always after visiting the toilet.

ASSESSMENT

In groups learners should look at the hand-washing facility that they have just made and evaluate it.

Ask them to:

- Write down as many environmental and health both positive and negative linked to the hand washing facility.
- Is it worth having it at their school and home? Why?

MAIN LEARNING AREA**LO: LO1: HEALTH PROMOTION**

The learner will be able to make informed decisions regarding personal, community and environmental health.

AS 3: Explains causes of communicable diseases (including HIV/AIDS) and available cures, and evaluates prevention strategies in relation to community norms and personal values.

**INTEGRATION WITH OTHER LEARNING AREAS:****AL1: LO1: LISTENING**

The learner will be able to listen for information and enjoyment, and respond appropriately and critically in a wide range of situations.

AS 2: Understands oral instructions and directions: Understands a complex sequence of instructions.

HL: LO 2: SPEAKING

The learner will be able to communicate confidently and effectively in spoken language in a wide range of situations.

AS 1: Communicates experiences, more complex ideas and information in more challenging contexts, for different audiences and purposes: shares ideas and offers opinions on challenging topics in a logical, coherent and structured way.

AS2: Applies interaction skills in group situations: gives balanced and constructive feedback.

ACTIVITY 9A: TYPES OF COMMUNICABLE DISEASES**ACTIVITY**

Learners will be able to:

- Explain the causes, symptoms and ways of dealing with communicable diseases.
- Identify the value of clean water in the prevention and management of all communicable diseases.

WHAT TO DO:

- Discuss with the learners the concept of communicable diseases.
- Brainstorm the types of communicable diseases, their causes and consequences.
- Discuss personal experiences. Make this an open discussion in class but make sure that learners do not feel awkward or embarrassed in these discussions.
- During discussions highlight that PREVENTION is better than CURE.

PREPARATION:

- Divide learners into groups of 3 / 6 depending on the size of your class. These will be their "HOME GROUPS"
- Have pieces of paper with numbers 1, 2 and 3.
- Let each learner in the group choose one number. To make the choice easier you may use different coloured paper (not compulsory).
- Each member of the group will get one number (1/2/3) in the case of a group with 3 members, but in a group of 6 there will be (two 1's; two 2's and two 3's) in a home group.
- All learners will be given information sheets. On each of these there is a brief explanation about the communicable disease: namely HIV/AIDS, CHOLERA and BILHARZIA.
- All learners will now move away from their HOME GROUPS (all 1's will get together, 2's together as well as the 3's.) These are now called the EXPERT GROUPS.

What will learners do in their expert groups?

STEP 1: Expert group-represents HIV/AIDS, 2 represents CHOLERA and 3 represent BILHARZIA .

STEP 2:

- Each expert group will read about their disease from the information sheet and discuss:
 - Its symptoms or effects e.g. Diarrhoea, loss of energy, dehydration etc.
 - Available cures and prevention strategies.
 - The value of water in the diseases.
 - The importance of the hygienic practices.
- Learners are welcome to give their own ideas during the discussions.
- After discussion everybody in the group should be an expert. Learners can now break and go back to their home groups.

STEP 3:

- In their home groups, experts will give a report back or teach other members of the group about what they have learnt from their respective expert groups.
- When all the experts have given reports in their home groups, each group should select a presenter who will present in brief about all the diseases.
- There will also be a scribe who will write down all what is to be presented.

IN THEIR PRESENTATIONS THEY WILL FOCUS ON:

- Common symptoms or effects of the disease e.g. Diarrhoea, loss of energy, dehydration etc.
- Available cures and prevention strategies.
- The value of water in all the diseases.
- The importance of the hygienic practices.
- What they have learnt from the lesson.
- What changes in their lives and of the community will be brought about by this lesson.

INFORMATION SHEET ON COMMUNICABLE DISEASES

HIV/AIDS	CHOLERA	BILHARZIA
<p>In South Africa the communicable disease that is infecting and killing many of our people is HIV/AIDS. The letters 'HIV' stand for Human Immuno-deficiency Virus. This is a virus that causes Acquired Immune Deficiency Syndrome, abbreviated as AIDS. The HI virus slowly damages the person's defense or immune system. The person becomes weaker and weaker and gets sick from many different germs. These germs cause them to lose weight, have bad diarrhoea, develop coughs, sores in their mouth, pneumonia, TB, fever and various other diseases.</p>	<p>Cholera is a bacterial infection, which is contracted by drinking contaminated water or by eating food, which has been in contact with contaminated water, flies or soiled hands. The germs, which cause cholera, can be found in the stools of infected human beings. People with cholera often get diarrhoea, get dehydrated because of losing lots of water through vomiting and watery stools.</p>	<p>Bilharzia is a disease caused by parasitic worms. It occurs when your skin comes into contact with contaminated fresh water which contains types of snails that carry schistosomes (worm eggs). Within days of becoming infected, you may develop a rash or itchy skin. Fever, chills, cough and muscle aches can begin within 1-2 months of infection. People who are repeatedly infected for many years can suffer from liver, bladder, lungs and intestine damage.</p>
<p>CAUSES:</p> <ul style="list-style-type: none"> - Through transmitted through contact with body fluids like blood, semen, vaginal fluid & breast milk of a person with HIV/AIDS <p>One can get it by:</p> <ul style="list-style-type: none"> - transfusion of infected blood. - Through syringes, needles used for injection that were used by an infected person. - Coming into contact with things (like razors, needles, knives), which have an HIV-positive person's blood . - Using things used by an HIV positive person who has sores without thoroughly washing or disinfecting them. - Having sexual intercourse with an infected person. 	<p>CAUSES:</p> <ul style="list-style-type: none"> - Drinking water that is contaminated with human faeces (cholera germs are in faeces of affected people) - This happens when sanitation is poor and when people defecate near water sources or wash infected baby's nappies in drinking water sources. - Eating food, which has been in contact with contaminated water, flies or soiled hands. 	<p>CAUSES:</p> <ul style="list-style-type: none"> - Fresh water becomes contaminated by schistosom eggs when an infected person urinates or defecates in the water. - The worm eggs that are in the urine hatch and go into snails - Young worms leave the snails and penetrate the skin of other persons swimming, wading, bathing or washing in the contaminated water source. - The parasites can also enter through the lining of the mouth or intestinal tract of people who drink untreated water.

<p>AVAILABLE CURES:</p> <ul style="list-style-type: none"> • No cure is available for HIV/AIDS. • There are measures that an HIV-positive person can take in order to prevent further infection and getting more weak and sick. These are: • Using Anti-retroviral drugs to boost the immune system and thus slow down the rate at which the virus spreads in their bodies. • Living a healthy lifestyle (i.e. eating healthy and fresh food, get plenty of fresh air, rest not smoking or drinking). • Keeping their bodies and environment clean and free of germs and drinking or clean safe water. 	<p>AVAILABLE CURES:</p> <ul style="list-style-type: none"> • Prepare a home solution of 8 teaspoons of sugar and half a teaspoon of salt in 1 litre of water. • People with diarrhoea should drink fluids as often as possible, prepared with clean and safe water. • Get medical attention. 	<p>AVAILABLE CURES:</p> <ul style="list-style-type: none"> • Safe and effective drugs are available for the treatment of bilharzias, visit your doctor.
<p>THINGS TO TAKE SERIOUSLY:</p> <ul style="list-style-type: none"> • Do not touch other person's blood in case your skin is broken. • Cover wounds or open skin. • Ensure good hygienic practices, especially for people who are HIV positive • Make the right and informed choices. • Its okay to say "NO". • No sex before marriage. • Take responsibility for your own body (use a condom). 	<p>THINGS TO TAKE SERIOUSLY:</p> <ul style="list-style-type: none"> • Everybody should use proper toilet facilities and wash hands after use. • Dispose of human faeces away from water sources. • Keep household water clean and safe. • Treat or boil drinking water. • Purify water from rivers before drinking it. • Wash food and cooking utensils with treated or boiled water. • Cook food very well. • Protect food from fly contamination. • Washing hands must become a habit – before preparing food, after using a toilet and after changing the baby's nappy. 	<p>THINGS TO TAKE SERIOUSLY:</p> <ul style="list-style-type: none"> • Avoid swimming or wading in fresh water when you are in countries in which bilharzias occurs. • Drink safe, treated water. • Bath water should be heated for 5 minutes or held in a storage tank for 48 hours before use. • Vigorous towel drying after accidental, very brief water exposure may help to prevent the parasite from penetrating the skin.

ASSESSMENT:

You need to design an assessment form to assess

- Knowledge gained by the learners from this lesson
- Oral and written presentations

EXTENSION: COMMUNITY OUTREACH

Following the knowledge that the learners may have acquired through reading the texts about water related diseases, learners are now to be given a community outreach project to demonstrate the knowledge they have gained.

- Give the learners a task of conducting a snap survey at their nearest clinic to find out about the cases of children that visit the clinic to be treated for the following diseases:
 - (a) Cholera
 - (b) Bilharzia
 - (c) HIV/ AIDS related diseases.

In their research they must use the following data collection instrument.

Questions

A. Has there been any patient treated for the following diseases:

Disease	Yes	No
• Cholera		
• Bilharzia		
• HIV/AIDS		

B. How many cases of:

Disease	Number
• Cholera	
• Bilharzia	
• HIV/AIDS	

C. Ages of the patients.

Between 10 -15	Between 15 -20	Under 10
• Cholera		
• Bilharzia		
• HIV/AIDS		

D. Where does majority coming from? Rural / urban / township.

E. How many:

- a. Girls -----
- b. Boys -----

2. Ask learners to discuss the results with their partners.

- (a) Learners should then be taught how to conduct analysis of the instrument.
- (b) Once they have identified the most common disease, they must then design a programme that will teach the community about the disease identified as a problem.
 - What is the disease?
 - Symptoms.
 - Preventative measures.
 - Where it is found?

GLOSSARY OF TERMS

Communicable diseases:	An infectious disease that is passed from one person to another.
Virus:	A kind of germ that can cause diseases.
Immune System:	All organs in your body that defend you from sickness or illness.
Pneumonia:	It is a serious disease that affects your lungs and makes it difficult to breathe.
Semen:	It is a liquid containing sperm that is produced by sex organs of men and male animals.
Vaginal fluids:	Fluids produced by the vagina.
Transfusion:	A process in which blood is injected in the body of a person who is injured badly or ill.
Disinfecting:	To clean something using substances that kills germs.
Bacteria:	A very small organism that causes disease.
Dehydrated:	Loss of too much water from the body that can result in illness or feeling weak.
Feaces:	A solid waste substance that people and animals pass through their bodies through the anus.
Sanitation:	A process of keeping places clean and healthy, especially by providing safe sanitation and clean water supply.
Wading:	To walk through something that makes it difficult to walk e.g. water or mud.

10. WASTE CAN HARM US!



MAIN LEARNING AREAS

LO: LO 1: HEALTH PROMOTION

The learner will be able to make informed decisions regarding personal, community and environmental health.

AS 2: Investigates a local environmental health problem using different data sources, and plans a strategy to address the problem.

INTEGRATION WITH OTHER LEARNING AREAS

HL: LO 3: READING AND VIEWING

The learner will be able to read and view for information and enjoyment, and respond critically to the aesthetic, cultural and emotional values in texts.

AS 8: Understands and uses information text appropriately.

ACTIVITY

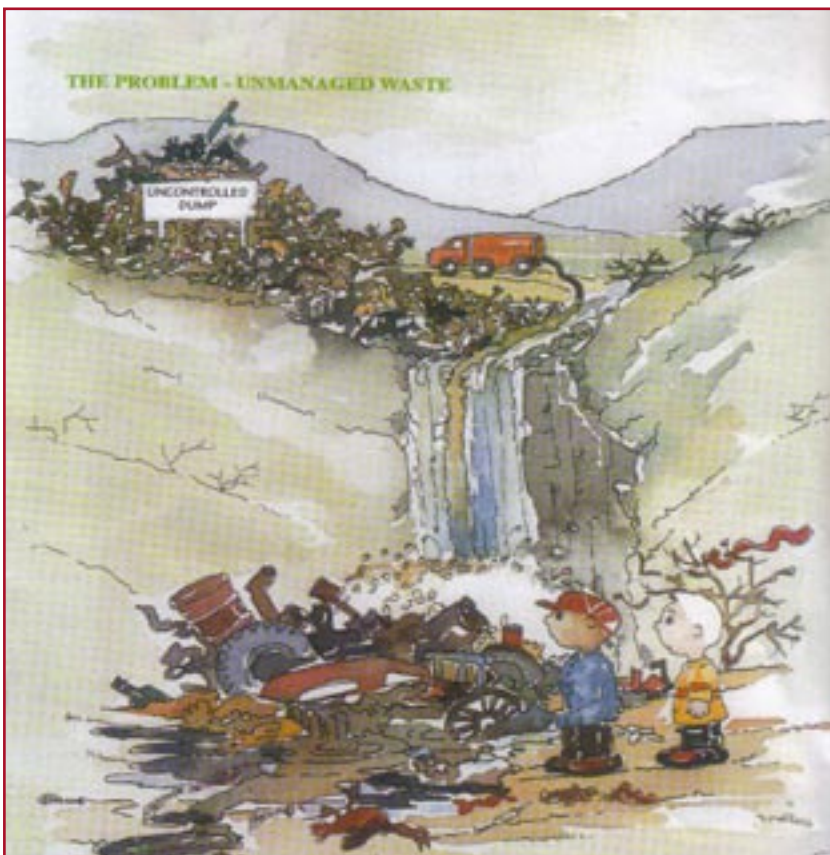
Learners will be able to:

- Identify any type of waste on the school premises.
- Learn both short-term and long-term harmful effects of unmanaged waste.
- Learn how to manage waste.

The aim of this lesson is to make you aware that waste can be harmful if not managed properly. We are all responsible for managing our waste so that it does not cause pollution.

ACTIVITY 10A: IDENTIFICATION OF TYPES OF WASTE

- Ask learners to look at the picture below.
- They must discuss with their partners what they see in the picture.



- Let them identify the types of waste by placing a tick (√) on the type found and a (X) on the ones not found.

Type of waste	√	X
• Paper		
• Plastic		
• Steel		
• Bottles		
• Cans		
• Rubber		
•		
•		

- Learners should conduct a small trip to the school premises.
- Ask them to identify any of the waste on the premises.
- Let them discuss with their partner how they can solve the problem of waste disposal at your school.

ACTIVITY 10B: WE ARE ALL WASTE GENERATORS

ACTIVITY

- Identify the causes of waste.
- Discuss the health problems associated with waste.

BACKGROUND INFORMATION

Waste is the rubbish and unwanted things that we throw out of our homes, offices and industries everyday. It may just be ordinary garbage in dustbins or it may be a large amount of dry or wet industrial waste. We all generate waste when we throw away packaging, food or other things. We also to make industrial waste when we buy and use products like toothpaste, a comb, a cassette tape or a motorcar. This is because waste was created when the product was made.

If waste is not controlled and is just dumped anywhere, it can harm us. We must dispose of it in a place where it will not pollute soil or water and where people will not be exposed to it. This applies especially to dangerous waste such as rotting food or medical and poisonous waste. Because we all create waste, we are all responsible for managing our waste so that it does not cause pollution. Our elected officials and waste management specialists help us to manage our waste. Usually we store waste in bins or bags and our local or regional authorities remove and transport it to a landfill. Waste must not be accidentally spilled, or dumped illegally into a hole, a stream or in the veld. Whoever handles, transports or disposes of waste must be qualified and trustworthy, so that the waste does indeed reach the landfill.

What to do?

Ask the learners to look at the picture below and answer the questions that follow:

- 1) What is wrong with the picture?
- 2) What are the problems that could be experienced in that environment?
- 3) What type of pollution is shown in this picture?



We are all waste generators!

Hey! You kids, don't mess my yard with that rubbish. Move away!

Sipho, don't play in that dirt.

Wow!! Jenny, look at this. Let's play here.

- List all the health-related problems associated with the waste.
- What can you do about this situation?
- Declare "war on waste".
- Find out all you can do about pollution and protest loudly when you see it happening.
- Report water pollution to the Department of Water Affairs and Forestry.

Assessment:

Check if the learners have mentioned some of these things.

Some of the harmful short-term effects of unmanaged waste are that:	Yes	No
The environment looks bad and smells bad.		
Flies, rats and other pests breed and spread disease.		
Plants, animals and humans are poisoned.		
The air and water becomes polluted.		

Long-term harmful effects include:	Yes	No
Poisonous chemicals stays in the environment and do not break down.		
Damage our natural resources like soil and water.		
Cancer and birth defects.		

Corrosive: Substances that can eat away at metals or living things.

General Waste: Waste that is not dangerous unless it is badly managed.

Hazardous Waste: Waste that is dangerous, poisonous, infectious, explosive, corrosive or flammable.

WATER SAFETY

11. SWIM WHERE IT IS SAFE TO DO SO



MAIN LEARNING AREA

LO LO4: PHYSICAL DEVELOPMENT AND MOVEMENT

The learner will be able to demonstrate an understanding of, and participate in, activities that promote movement and physical development.

AS5: Applies basic First Aid in different situations.

INTEGRATION WITH OTHER LEARNING AREAS

HL LO3: READING AND VIEWING

The learner will be able to read and view for information and enjoyment, and respond critically to the aesthetic, cultural and emotional values in text.

ASI: Reads and responds critically to a variety of South African and international fiction and non – fiction (Journals, poetry, novels, short plays, newspapers, textbooks, etc).

- Uses appropriate reading and comprehension strategies.

HL LO 5: THINKING AND REASONING

The learner will be able to use to think and reason, as well to access, process and use information for learning.

AS1: Uses language to think creatively:

- Describes what the learner visualises after reading or listening to a text.

ACTIVITY 11A: THE DANGERS OF WATER

ACTIVITY

Learners will be able to:

- Identify the dangers of water
- Discuss the safety measures around water.
- Arrange the words in alphabetical order.

BACKGROUND INFORMATION

Many people like to swim or take part in water sports such as canoeing, surfing and waterskiing. But, every year we hear about people who have drowned or have been injured in accidents in water. To prevent these tragedies, it is essential we know about water safety.

What to do?

- Ask learners to read the article on the Berg River drowning accident and then answer the questions.

Teens drown in Berg River

A canoeing trip on the Berg River ended in tragedy for a Western Cape family when their canoe capsized and a teenage brother and sister disappeared.

The brother (17) and sister (14) and their mother had set out in an inflatable canoe. All of them were good swimmers. But they did not realise how fast the river was flowing. Their combined weight in the canoe made it less buoyant. The boat capsized when it went into rough water and eventually wrapped itself around a tree in the river. The teens and their mother were flung out.

The boy was swept away by the force of the river and the body of his sister was found underwater, tangled in the lower branches of the tree underneath the canoe. Their mother grabbed onto the tree and later swam to safety. None of the three were wearing life jackets or helmets.

A spokesperson for the Metro Rescue team said the river was flowing 'incredibly fast' and was extremely dangerous. He warned people not to go on rivers after heavy rain when the river is full and flowing strongly.

He added that it is essential that people always wear life jackets when taking part in



With courtesy of the Cape Times

water sports. Helmets prevent head injuries which also lead to drowning.

1. Learners can work in pairs for this activity to respond to the following questions related to the article.
 - (a) Identify three things that made the river outing dangerous for the family.
 - (b) What safety measures did the family take? What should they have done? Talk about it with your partner.
2. Why should people wear life jackets and helmets when canoeing on an open river?
3. Find out the meaning of these words:
 - (a) Capsized
 - (b) Buoyant
 - (c) Inflatable.

Expect some of the following responses:

- (a) The river was flowing very fast; the combined weight of the brother and sister and their mother made the canoe less buoyant; they were not wearing life jackets or helmets.
 - (b) The members of the family could all swim, but they took no safety measures. They should have noted how fast the river was flowing; they should have realised that three of them were too heavy for the canoe; they should have worn life jackets and helmets.
2. It is because if you fall into a river a life jacket helps you to float, and a helmet protects your head from injuries.
3.
 - (a) Capsized- overturned
 - (b) Buoyant – able to stay afloat
 - (c) Inflatable – inflatable canoe – a canoe that is pumped up with air.

ACTIVITY 11B- WATER SAFETY

This is an enrichment activity which aims at conscientising learners about the water safety code and emergency first aid.

The Royal Society for the Prevention of Accidents publishes the following Water Safety Code:

1. Spot the dangers

Water can look safe, but it can be dangerous. Learn to spot and keep away from dangers.

2. Know the difference

You may be able to swim in a warm indoor pool, but that does not mean that you will be able to swim in cold outdoor water.

3. Check new places

New places that you visit may have hidden dangers that you do not know about. Always ask somebody who knows.

4. Take safety advice

Special flags and notices may warn you of danger. Know what the signs mean and do what they tell you.

5. Go with a grown-up

Children should always go out with a grown-up, not by themselves. A grown-up can point out dangers or help if somebody gets into trouble.

6. Learn how to help

You may be able to help yourself and others if you do know what to do in an emergency.

Ask learners to read the following information and answer the questions.

EMERGENCY FIRST – AID

Here is some practical advice for what to do in emergencies involving water.

Drowning	Hypothermia
<p>Drowning is a form of suffocation. The supply of air to the lungs is cut off completely by water. This cut off does not create an immediate lack of oxygen in the body. There is a small reserve in the lungs and in the blood which can sustain life for up to six minutes or longer at low temperatures.</p> <ul style="list-style-type: none">• A victim of drowning should be removed from the water as quickly as possible.• Emergency services should be called immediately.• If there is someone trained in first-aid present, he or she should begin artificial respiration. If not, wait for the emergency services to arrive.	<p>Hypothermia is the cooling of the entire body to dangerous levels. First, the victim will shiver, then he or she will become drowsy, before eventually falling unconscious.</p> <ul style="list-style-type: none">• Get the victim out of the elements (wind, rain, snow, cold, etc.)• Remove all wet clothing.• Wrap the victim in blankets, making sure that the blankets are under, as well as over, the victim.• To keep the victim warm, build a fire or place heat packs, electric heating pads, hot water bottles, or even another rescuer in the blankets with the victim. Do not warm the victim too quickly.• Get the victim to a medical facility as soon as possible.

QUIZ

State whether the following statements are True or False:

1. A victim of drowning should not be removed from the water as quickly as possible.
2. Special flags and notices may warn you of danger.
3. Drowning is a form of swimming.
4. Children should not always be accompanied by grown-up when going to swim.
5. Hypothermia is the cooling of the entire body to dangerous levels.
6. You may be able to help yourself and others if you do know what to in an emergency.

Arrange the following words in alphabetical order:

- Respiration
- Emergency
- Hypothermia
- Unconscious
- Drowning
- Temperatures
- Water
- Always
- Children
- Dangerous

Answers to Activity 13B

1. False
2. True
3. False
4. False
5. True
6. True

- Always
- Children
- Dangerous

- Drowning
- Emergency
- Hypothermia
- Respiration
- Temperatures
- Unconscious
- Water

ASSESSMENT

Assess whether the learners were able to:

- Identify the dangers in safety measures around water.
- Arrange the words in alphabetical order.

FORESTRY



12. THE VALUE OF TREES

MAIN LEARNING AREA

NS LO3: SCIENCE, SOCIETY AND THE ENVIRONMENT

The learner will be able to demonstrate an understanding of the interrelationship between science and technology, society and the environment.

AS2: Understands the impact of science and technology: Suggests ways to improve technological products or processes and to minimise negative effects on the environment.

INTEGRATION WITH OTHER LEARNING AREAS

HL LO5: THINKING AND REASONING

The learner will be able to use language to think and reason, as well as to access, process and use information for learning.

AS: Process information: Compares and contrast information and ideas and indicates the basis for the comparison.

HL LO 3: READING AND VIEWING

The learner will be able to read and view for information and respond critically to the aesthetic, cultural and emotional values in texts.

AS 9: Interprets and analyses independently graphical text and transfers information from one form to another.

ACTIVITY

In this activity, learners will:

- ⊙ Investigate the dangers of not protecting trees.
- ⊙ Discover activities that are dangerous to trees.
- ⊙ Discuss the effect of human activities on the value of trees.

BACKGROUND

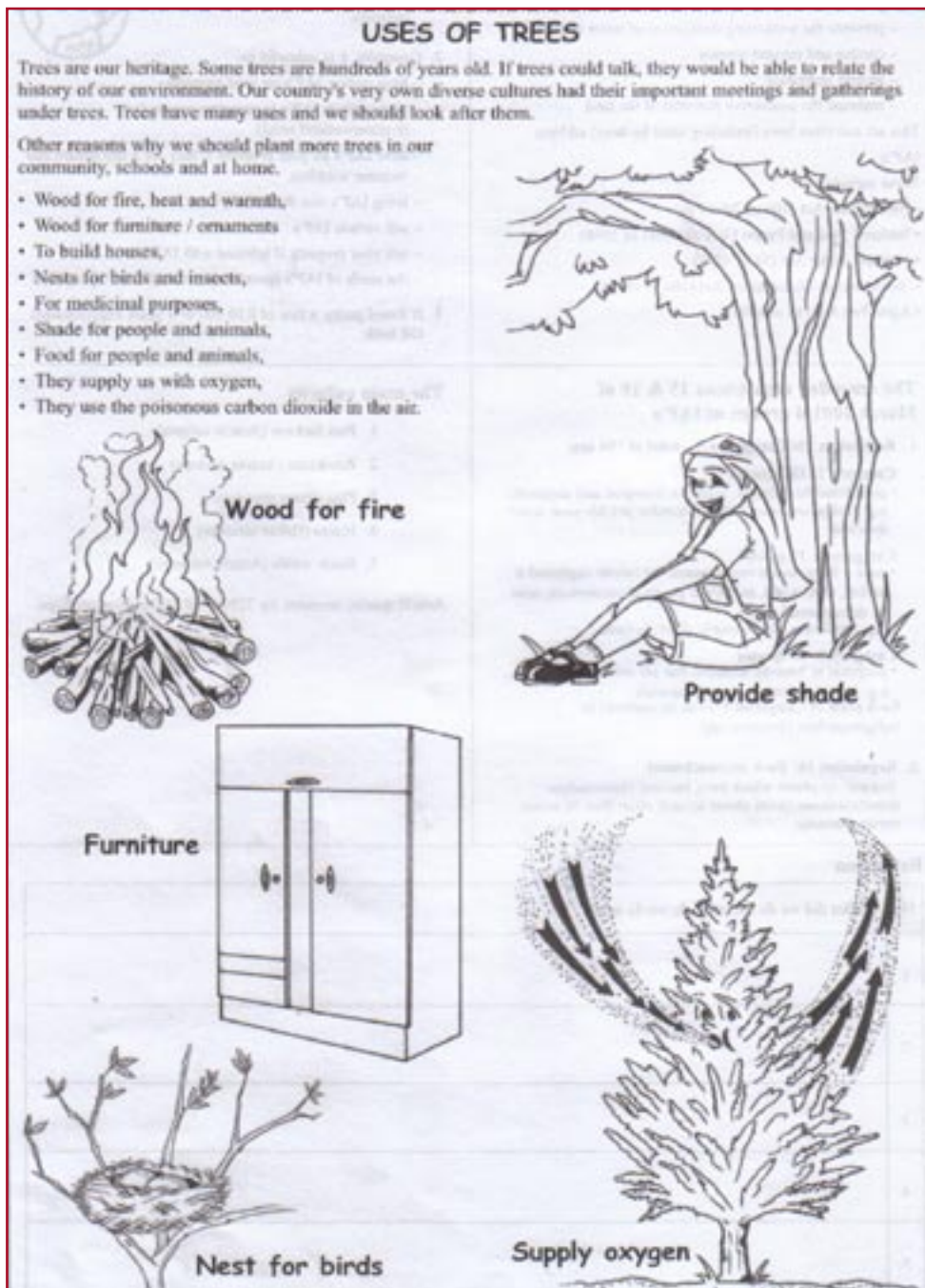
Trees are important resources in our lives. Without trees many things will go wrong. A treeless community could be a challenged community. Therefore trees should be protected due to their sentimental value in our lives.

ACTIVITY 12A: TREES ARE IMPORTANT, THEY MUST BE PROTECTED

WHAT TO DO?

Learners should work in groups for this activity.

- Ask learners to read the following information on uses of trees.



- Ask them to design a poster to highlight the uses of trees. They can draw, cut and paste newspaper pictures and all pictures must be labeled.

ASSESSMENT

- Group assessment

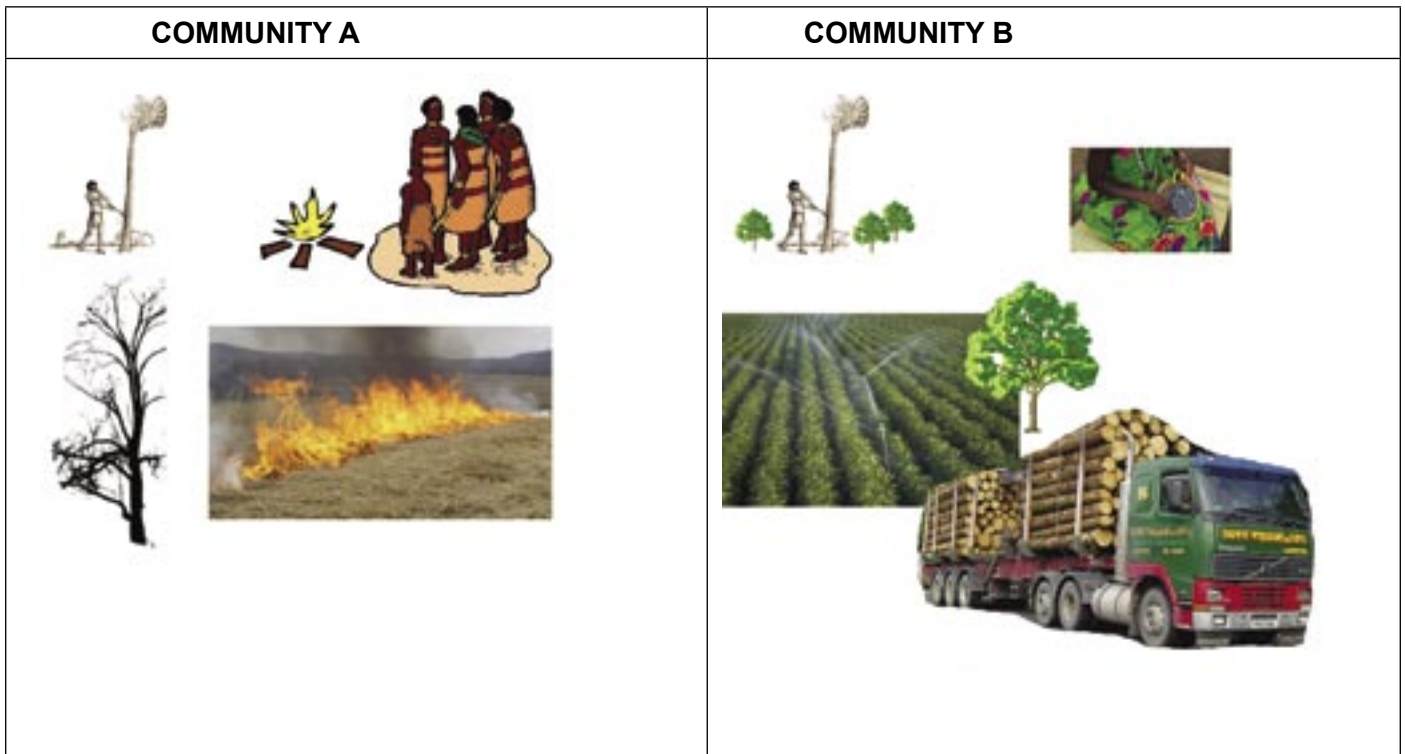
Rubric

	1	2	3	4
1. The poster has a topic				
2. Pictures relates to the topic.				
3. Pictures have labels.				
4. The poster has a border.				
5. Words and pictures on the poster are big enough to see from a distance of at least 2 meters.				

ACTIVITY 12B: HOW COMMUNITIES DESTROY TREES

What to do

© Ask learners to look at the following picture of the two communities leaving in more or less the same area.



Ask learners to discuss with their partners what they notice in the pictures.

Let them refer to the picture to answer the following:

(a) Which community is doing the wrong thing?

(b) List all the human actions that disturb the value of trees in the picture.

(c) What should that community do to protect the value of plants/ trees?

Did you know?
 Some trees are protected by law, through provincial legislation or the National Forest Act (No 84 of 1998). In 2005, 47 trees species were declared protected trees under the National Forest Act.

ENRICHMENT ACTIVITY

Get yourself a copy of the National Forest Act (No 84 of 1998) from the Department of Water Affairs and Forestry, so that you can assist the learners in this activity.

What is a protected tree?

A protected tree can either be an individual tree or a tree species that is protected by law. Trees can either be protected through provincial legislation or the National Forest Act (No 84 of 1998). In 2005, 47 tree species were declared protected trees under the National Forest Act. Examples of protected trees are the Boobab, Camel Thorn, Stinkwood and Wild Teak trees. Some indigenous trees have been declared as protected tree species because there are few of them left in South Africa. In some cases trees are protected because they are heavily utilised. In some provinces all trees are protected through conservation legislation of the province.

- ⊙ Ask them to conduct a research about protected trees.
- ⊙ Find out about the following:
 - (a) List of indigenous tree species that have been declared protected tree species.
 - (b) Examples of protected tree species.
 - (c) The value of at least 3 examples of the protected tree species.
 - (d) The reason why these tree species were declared protected.

You may get information from the copy of the Act and/ or in the libraries near you. Learners could use their exercise book to write down the research.

13. SOCIAL AND ECONOMIC IMPORTANCE OF THE FOREST

MAIN LEARNING AREA

SS (G) LO1: GEOGRAPHICAL ENQUIRY

The learner will be able to use enquiry skills to investigate geographical and environmental concepts and processes.

AS1: Identifies sources of information, including simple statistics, to help answer the question about a social or environmental issue or problem (find sources).

INTEGRATION WITH OTHER LEARNING AREAS

HL LO3: READING AND VIEWING

The learner will be able to read and view for information and enjoyment, and respond critically to the aesthetic, cultural and emotional values in texts.

AS3: Explains interpretation and overall response to text, giving reasons based on the text or own experience.

HL LO5: THINKING AND REASONING

The learner will be able to use language to think and reason, as well as to access, process and use information for learning.

AS1: Uses language to think creatively:

- Describes what learner visualises after reading or listening to a text.

ACTIVITY 13A – SOCIAL IMPORTANCE OF FORESTRY

ACTIVITY OUTCOMES

Learners will be able to:

- Learn about both the social and economic importance of the forest.

WHAT TO DO:

- Ask learners to read the information on the social and economic importance of the forest, and answer the questions that follow.

Social importance of forests

Most forests occur around the rural areas of South Africa. Due to low job opportunities and underdevelopment in rural areas, most of people living in these areas are poor. Because of this, the rural people rely on the forest resources for their daily survival. They depend on forests for the following:

1. **Basic needs of survival** - many rural people depend on forests for their daily living:
 - Medicinal plants - traditional herbal medicines harvested from the forests for primary health care.
 - Poles - timber poles are used for building, fencing etc.
2. **Money saving** - the following options are created by forests:
 - Using medicinal plants instead of buying medicines from a pharmacy
 - Firewood instead of paying for electricity for cooking and heaters
 - Harvesting wild fruits instead of buying from supermarkets
3. **During times of adversity** rural communities often sell forest products to earn a daily living.

Wild fruits and animals they form an important source of nutrients and contribute to the food security of the rural households
Firewood - for cooking purposes

Wild fruits and animals they form an important source of nutrients and contribute to the food security of the rural households
Firewood - for cooking purposes

Wild fruits and animals they form an important source of nutrients and contribute to the food security of the rural households
Firewood - for cooking purposes

- Match the following sentences

A	B
a. Medicinal plants	1. Rely on the forest resources for their daily survival.
b. Fire wood	2. Are used for building, fencing etc.
c. Wild and animals	3. Traditional herbal medicines harvested from the forest for primary health care.
d. Rural people	4. They form an important source of nutrients and contribute to food security of the rural household.
e. Timber poles	5. For cooking purposes.

- Let them answer the following questions:

1. Where does most forest occur around South Africa?

2. What is the money saving options that are created by forests?

3. What do the rural people do during times of adversity?

4. Give one example of a trade company that benefits from the timber pole market and explain how?

Total marks: 11

ASSESSMENT

Learner's ability	Code	Marks allocated
Performance has exceeded the requirements of the learning outcome of this grade.	4	10-11 Marks
Performance has satisfied the requirements of the learning outcome of this grade.	3	6-9 Marks
Performance has partially satisfied the requirements of the learning outcome of this grade.	2	4-5
Performance has not satisfied the requirements of the learning outcome of this grade.	1	Under 4 marks

Economic importance of forests

Charcoal production
Charcoal is made from wood. Charcoal is used for barbecues and can be sold in South Africa or Overseas



Trade in wild fruits
Wild fruits can also be harvested from the forests and sold to local markets or can be taken for processing to generate money



Employment
The formal forestry sectors employ more than 152,000 people, mostly in the rural areas. The forestry companies provide housing serviced with electricity, water and sanitation, pre and primary schools and clinics. Other key benefits associated with formal employment are access to vocational, technical or academic training.



Others
There are many more forest produce that could be sold for money generation e.g. honey production, sawmilling, trade of forest ferns and forest mushrooms

Environmental importance of forests
Forests reduce erosion, maintain soil fertility, maintain water quality and harbor biological diversity



Economic importance of forests

Forest resources provide ample business opportunities, such as:
Medicinal plants trade
Medicinal plants are used by many people in South Africa. Medicinal plants are also processed to produce herbal medicines which could be bought at herbal shops. If medicinal plants are harvested sustainably they can provide a generous income to harvesters and traders.



Manufactured timber products
Trees are used to make furniture, coffins etc. All these are needed by humans, as such many people buy these products and traders generate money from selling these products.



The timber pole market
The poles are used to build houses, fencing, fixed telephone lines etc.
Traders can sell different poles for example Telkom for telephone lines, builders for building of mainly wooden houses etc



• Answer the following questions:

1. What are the business opportunities that forest resources provide? Mention any four.

2. What can medicinal plants provide?

3. What can we use trees for?

4. Who generates money from selling the products that we get from trees?

5. What are the poles used for?

6. What are other key benefits that are associated with formal employment?

7. What is the environmental importance of forests?

ASSESSMENT

Learner's ability	Code	Marks allocated
Performance has exceeded the requirements of the learning outcome of this grade.	4	14-17 Marks
Performance has satisfied the requirements of the learning outcome of this grade.	3	10-13 Marks
Performance has partially satisfied the requirements of the learning outcome of this grade.	2	6-9
Performance has not satisfied the requirements of the learning outcome of this grade.	1	Under 5 marks

ALIEN INVASIVE PLANTS

14. LAWS RELATED TO INVASIVE ALIEN PLANTS

MAIN LEARNING AREA

NSL O3: SCIENCE, SOCIETY AND THE ENVIRONMENT

The learner will be able to demonstrate an understanding of the interrelationship between science and technology, society and the environment.

AS2: Understands the impact of science and technology: Suggests ways to improve technological products or processes and to minimise negative effects on the environment.

INTEGRATION WITH OTHER LEARNING AREAS

HL LO3: READING AND VIEWING

The learner will be able to read and view for information and enjoyment, and respond critically to the aesthetic, cultural and emotional values in texts.

AS9: Interprets and analyses independently details in graphical texts and transfers information from one form to another.

HL LO5: THINKING AND REASONING

The learner will be able to use language to think and reason, as well as to access, process and use information for learning.

AS1: Uses language to think creatively:

- Describes what learner visualises after reading or listening to a text.

ACTIVITY 14A: KNOW THE LAWS

ACTIVITY

Learners will be able to:

- Discuss about the position of the alien invasive plants in the school grounds by referring to the map.
- Interpret the cartoon and answer questions by referring to it.

GUIDELINES FOR THE CHAPTER

When controlling weeds and invader plants in areas where they are not allowed in terms of CARA Regulation, control methods should be used that is appropriate. Social awareness. Values: compassion, accountability.

Ask the learners to take a good look at the cartoon below and answer the following questions:



1. What do you think is happening in the poster?
2. What law has the owner of this house broken?
3. What does the home owner mean when he says "A man's home is his castle"?

4. What does the Department official mean when he says “On the other hand, no man is an island.”
5. Do the forestry workers have the right to cut down the trees?

ACTIVITY 14B: CARA REGULATIONS

Do a brief discussion of the position of any invasive alien plants on the school grounds by referring to the map (visit actual sites on the school grounds)
 Explain the CARA regulations and what they imply by referring to the worksheet.

BE WARNED! GET THE INVADING ALIEN PLANTS BEFORE THE LAW GETS YOU!

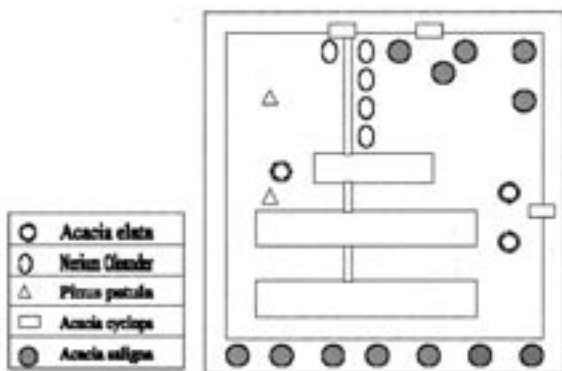
CARA – Conservation of Agricultural Resources Act (Act No 43 of 1983)

SOME OF THE LAWS

1. It is the duty of a land user or owner to remove IAPs from their property and control the spread of IAPs on their property.
2. Generally it is unlawful to:
 - Have certain IAP's on your property.
 - Grow certain IAP's in sensitive areas (e.g. riverine/ wetland areas).
 - Have IAP's on property if they are a fire hazard and increase wild fires.
 - Bring IAP's into the country.
 - Sell certain IAP's.
 - Sell your property if infested with IAP's.
 - Let seeds of IAP's spread to your neighbour's property.
3. If found guilty you can get a fine of R10 000 or 4 years imprisonment or both.

ACTIVITY 14C: IDENTIFYING INVASIVE ALIEN PLANTS

Ask the learners to study the map of the school grounds and answer the questions concerning the CARA Laws.



1. Who should be held responsible for removing alien plant invaders from their property?
2. Why do you think the trees outside the school grounds can become a problem?
3. Do the neighbours at the front gate have the right to complain about the tall Port Jackson tree? Give reasons.
4. What category does the Oleander fall under and what is the duty of the school in this regard?
5. Who will have to pay the bill if the council has to remove the plants?

We have to make land - users responsible for the alien plant invaders they shelter ... so if your neighbour's property is full of invader plants, you can now take action.

At last! A new earth law for South Africa that will help us in the fight against invading alien plants.

And if your land is full of invader plants, and you don't get rid of them, the Act allows us to clear the land at your cost.



15. CAREER FAIR

MAIN LEARNING AREA

HL LO 3: READING AND VIEWING

The learner will be able to read and view for information and respond critically to the aesthetic, cultural and emotional values in texts.

AS 9: Interprets and analyses independently graphical text and transfers information from one form to another.

INTEGRATION WITH OTHER LEARNING AREAS

LO LO3: PERSONAL DEVELOPMENT

The learner will be able to use acquired life skills to achieve and extend personal potential to respond effectively to challenges in his or her world.

AS 6: Describes and selects a range of problem-solving skills for different contexts.

ACTIVITY

Learners will be able to;

- ⊙ Identify different water related careers.
- ⊙ Design a career fair exhibit that will showcase water- related careers.

BACKGROUND INFORMATION

Our lives are surrounded and maintained by water. Therefore, learning more about water, its origins, maintaining its quality, protecting and conserving it, is important to all of us. Hence a water-related career is probably one of the most important careers to choose.

ACTIVITY 15A: WATER-RELATED CAREERS

In this activity learners will identify different water-related careers. There are many water-related careers which are currently not made available to most people, particularly African people. It is important that learners are orientated at this stage to all the career options that they can explore.

CAREER OPPORTUNITIES IN FORESTRY

Employment opportunities range from entrepreneurial enterprises to the corporate environment locally and abroad:

- Forester
- Forestry Scientist
- Plantation Manager
- Environmental Planner
- Forestry Consultant
- Forest Enterprise Development Specialist
- Forestry Local Development Specialist
- Timber Grower
- Forestry Nursery Manager
- Forestry Global Information Systems Specialist
- Forestry Extension Officer
- Forestry Researcher
- Forest Ecologist
- Forestry Lecturer
- Forestry Production Manager
- Forestry Logistics Manager
- Tree Breeder
- Natural Resource Manager
- Rural Development Advisor
- Furniture Maker
- Wood Technologist
- Forestry Fire Advisor

What to do:

Support the learners in carrying out the following activity: Provide learners with the necessary information and give

assistance where necessary. In this activity learners must:

1. Visit the nearest library and request the librarian to show them books that discuss water-related careers.
2. List all those careers, making a summary of the following topics:
 - ⊙ Job Title
 - ⊙ Educational background
 - ⊙ Daily duties / responsibilities
 - ⊙ Work opportunities
3. Collect as many magazines as possible. Cut out as many pictures as possible relating to water careers.
4. Design a poster or background that provides information about forestry, by pasting the pictures/ photos you have collected.
5. In their poster a summary of each job career must be written under or adjacent to each picture.
6. Learners may do this project individually or as a group.

ASSESSMENT

Design a rubric that will assess learner's ability to:

- Research the information from various sources.
- Listing the forestry career options.
- Summarise the title, job description and the requirements for the job option.
- Designing a poster that fits the purpose of the exercise.

ACTIVITY 15B: A CAREER FAIR EXHIBIT

In this activity learners will:

- ⊙ Plan a programme to exhibit their posters.
- ⊙ Draft a letter to invite guest speakers who know more about the career.
- ⊙ Exhibit own posters to other fellow learners.

In this activity learners are engaging in a career exhibition to conscientise other fellow learners on different careers in water and sanitation. During this day they will not only exhibit the posters they designed, but also invite other reputable people that are currently in those scarce careers.

PREPARATION FOR THIS ACTIVITY

To make this day a success, thorough preparation for this day needs to be done. Make this day learners' day and assist them in planning for it. The plan should include:

- Planning a programme to exhibit their posters.
- Draft a letter to invite guest speakers who know more about the career.
- Exhibit their posters to other fellow learners.

What should learners do?

Learners should do the following:

STEP 1: Write an invitation letter.

- ⊙ Draft a letter inviting guests to make a presentation about forestry careers. The Department of Water Affairs & Forestry will help you with a guest speaker or arrange to find one for you. They need to be taught how to write a letter. Learners must follow the following format:

Your address

Date

Name of the person you are writing to.

Address

Dear Sir/Madam (or his/her name if known)

INVITATION TO THE CAREER FAIR EXHIBIT.

Our school will be hosting a career fair exhibit on..... At.....
The programme will start at..... and end at.....

We would like to invite you to grace the occasion and make a presentation on forestry career. Attached is a programme reflecting the times at which your presentation will be.

Your attendance to this exhibition will be appreciated.

Yours Sincerely

STEP 2

- Design a programme for the day.
- The following is an example of the programme.

PROGRAMME FOR CAREER GUIDANCE WEEK

Week 1 Day 2 Tuesday 27 August, 2006

Name of School: Venue: Library

Time: 11:00 to 2.30pm

Programme Director: Mr. Mhlanga

Ushers: Gugu Zondi
 Nancy Boloto

Reporters: Lulama Mpithi
 Sizwe Nanki

Photographers: Lumko Dingiswayo
 Lettie Diko

- | | |
|-----------------------------------|-----------------------|
| 1. Opening Prayer: | Ms Mathebula |
| 2. Welcome: | Principal Mr. Dubase |
| 3. Introduction of Guest Speaker: | Luzuko Mveli |
| 4. Guest Speaker: | Professor Loe Tobongo |
| 5. Exhibition: | |
| 6. Vote of Thanks : | Linda Veliso |
| 7. Closing Remarks: | Mrs. Mangaliso |
| 8. Benediction / national Anthem | |

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