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WATER IS LIFE

Water is life

1.Water purification

ACTIVITY

In this activity you will:

- Explore the ways to take salt out of water before using it.
- Make a model of a desalination plant (factory).

BACKGROUND INFORMATION

Water is humanity's second most precious resource after the air we breathe. Water covers 70% of the earth surface, but only 1% is available as fresh water. The major portion of the earth is mainly oceans with salt water. Over 1.1 billion people on earth lack access to safe water and 2.6 billion live without proper sanitation. Water- related diseases result in over five million deaths annually, of whom most are children.

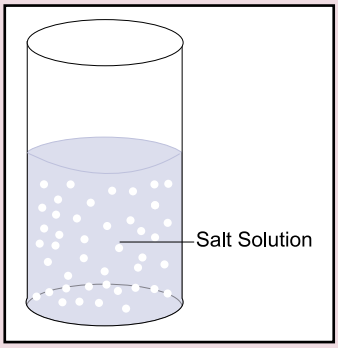
You will need:

- **Glass bowl.**
- **Dinner plate.**
- **Saucer containing salt water.**

ACTIVITY 1A – Desalination – Removing salt from water

What to do:

1. Prepare a salt solution by dissolving about two teaspoons (10ml) of salt in one cup (250ml) of water. How does it look?

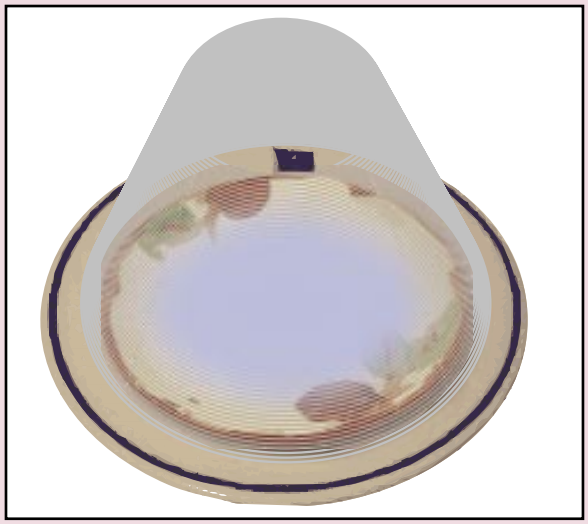


Did you know?
In some places there is not enough water and the only water is salty ocean water.

2. Put the saucer on the dinner plate.
3. Fill the saucer with salt water.
4. Place the glass bowl over the saucer. Make sure that the glass bowl is dry.
5. Leave the apparatus to stand in a sunny place.
6. After some time observe what happens.
   (a) In the glass bowl.

   .....
   (b) On the saucer.

   .....
7. Turn the glass bowl back to its position and notice what happens.



Observations

Questions

(a). What would you do to find out if the water droplets on the glass jar is fresh or salt water?
(b). What will you do to collect the drops of water on the glass bowl?

Explanation

This process you have demonstrated that is used to remove salt from water. It is the process that water treatment plants follow to change salty water into fresh or drinkable water. The table salt we use in our houses for cooking is the by-product of this process.

Extension activity

Dudu's family lives in the island which is mainly surrounded by the sea. Look at the picture that shows Dudu's house and **suggest ways in which Dudu's family could get access to fresh water.**

- Brainstorm that with your partner.
- Present a plan to the classroom on how Dudu's family could access fresh water.

ACTIVITY 1B – WATER PURIFICATION BY EVAPORATION AND CONDENSATION

In your lower grades you have studied how water is cleaned or purified through boiling and adding bleach. Fresh water is limited and its quality is under constant pressure. Preserving fresh water quality is important for drinking, water supply, food production and recreational water use. Evaporation and condensation are the main mechanisms that help to purify water from water-related diseases.

OUTCOMES FOR THIS ACTIVITY

In this activity we will:

- Demonstrate methods of purifying water i.e. evaporation and condensation.
- Complete the quiz relating to water.

For this activity you will need:

- **4 cups of dirt / sand**
- **2 litre container**
- **A large glass bowl**
- **A short glass**
- **Clear plastic wrap**
- **Sun**

What to do:

1. Mix the dirt / sand and water in a bowl.
2. Put a clean and empty short glass in the centre of the bowl.
3. Place the bowl outside in the sun.
4. Cover the bowl with the plastic wrap.
5. Place a small stone on the plastic wrap directly over the cup.
6. Leave the bowl to stand for several hours.
7. Observe what happens.

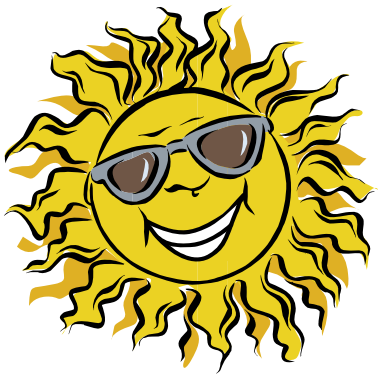
(a). In the glass.

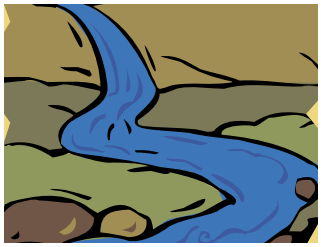
(b). In the bowl.

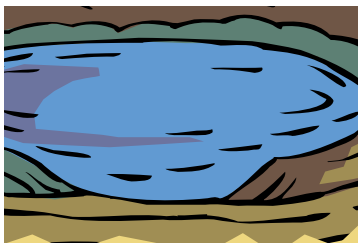
- Try to answer the following questions based on the experiment:
- Work with your partner for this activity.
- In the discussion remember the water cycle we did in Grade 4.

Questions

1. Which processes for water purification are demonstrated in the experiment?







2. What does the plastic wrap represent?
3. What do you think will happen if the plastic wrap was dirty?

WATER QUIZZ

Complete the following sentences by putting the letters in the right order.
E.g. Do not (etswa) water. **Waste**

1. All living things need (tawer) to live.
2. When the sun heats the earth's surface, water will evaporate back into the air and become part of the (dlocu).
3. 1% of all water on earth is the (hefrs) water.
4. Water can be saved by taking a quick (howser).
5. Washing cars with a (kecbut) instead of a hosepipe will save water.
6. Ask your (mfaiyl) to always save water.

VOCABULARY:

- **Condensation** is the process through which vapour becomes a liquid.
- **Evaporation** is the process through which a liquid becomes a vapour.

Water is life

2. A Brief look at the Water Act!

ACTIVITY 2A

- Together with your partner read the following fact sheet and note words and phrases that you do not understand.
- Use your dictionary to check their meaning and ask your educator to assist you.
- Answer the questions that follow.

The constitution of the Republic of South Africa in chapter2 (Bill of Rights) P. 24 states that everyone has the right to

a) An environment that is not harmful to their health and well being; and
b) To have the environment protected for the benefit of the present and future generations through, reasonable laws and other measures that-

I. Prevent pollution and ecological degradation
II. Promote conservation, and
III. Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."

South Africa's law about water is contained in the National Water Act. This Act specifies that government (through the Department of Water Affairs and Forestry) as the public trustee of the nation's water resources must make sure that water is protected, used and developed, managed and controlled in a sustainable way so that all persons can benefit.

The Act also recognises that all people have a basic need for water for drinking and hygiene and that these needs must, at all times, be satisfied.

The Department of Water Affairs and Forestry is thus responsible for water resource management for the following purposes:

- Social development: everybody should have equal access to water.
- Economic growth: water must support economic and social development.
- Ecological integrity: water resources must be protected so that the resource will continue to provide water in the future.

Complementing the Water Act is the Water Services Act (no. 108 of 1997). Its aim is to define roles and responsibilities of the different spheres of government like municipalities in order to ensure that everyone has access to basic water supply and basic sanitation. Various structures, from municipalities themselves, private companies, local people and businesses share this responsibility.

In September 2000, the Free Basic Water policy was announced by the Minister of Water Affairs and Forestry. It committed the government to providing 6 000 litres of free water per month, regarded as the basic human requirement of water, to each household.

Adapted from: Enviro Teach Vol 11, May 2004: Sharenet Project, p.11.

CLASSWORK:

1. Which government department has the responsibility of being a trustee of the nation's water resources?
2. Which law deals with water related services in South Africa?
3. By passing this law what is the government trying to achieve or ensure?
4. What basic needs for water are mentioned in the fact sheet?
5. According to the law, how many litres of free basic water must be obtained by each household?
6. Which other government structure is responsible for the supply of water and sanitation facilities to local communities?
7. State whether the following statements are true or false. Water resource management aims to ensure that:
    a) Everybody gets water.
    b) Water is used for economic purposes.
    c) Water sources are protected.
8. Does your household get this water? If not, why not?
9. If your household does get this free water find out from your water account / local municipality how much money do you save from this per month?

EXTENSION: STIMULATION EXERCISE

To be done in groups.

- Pretend that you are a Minister of Water Affairs and Forestry. Your group is a Parliament where there is a debate on how can you control water so that it can be used sustainable. Give three suggestions.
- In your group design a poster that will encourage people to RESERVE, RE-USE and RECYCLE water.

Each group will display its poster and then a reporter/speaker from each group will present their reports as a Minister of Water Affairs and Forestry.

WATER USE EFFICIENCY

Water use efficiency

3. Measuring the amount of rain

OUTCOMES FOR THIS ACTIVITY

At the end of this activity you will be able to:

- Make a rain gauge following given instructions.
- Use the rain gauge to record the average rainfall in your area.
- Collect data and draw conclusions.

BACKGROUND INFORMATION:

South Africa is a dry country. The major part of the country has very little rain and in the eastern half of the country where more rain does fall it falls only during the rainy season and for half the year little rain falls. This means we have to be very careful about using our rainwater and storing it for the dry season.

We store water in dams. We also use rainwater tanks and reservoirs, but in the dry part of the country the most important source of water is groundwater.

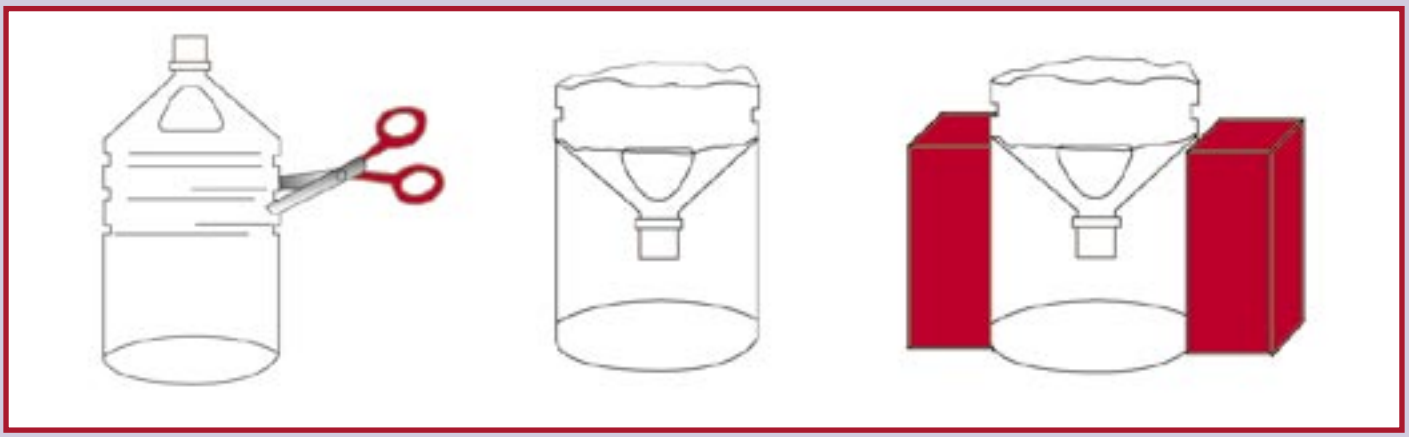
ACTIVITY 3A – Making a rain gauge

- Make a rain gauge that will help you to collect water when it rains so that you can record how much rain has fallen.

You will need:

- **A two litre plastic bottle**
- **Sharp object to cut the bottle**
- **Two bricks**

METHOD:



1. Cut off the top of a plastic two-litre cold drink bottle.
2. Turn the top upside down inside the bottom half.
3. Put it firmly between two bricks and leave it in the open.
4. Make sure it has no water in it.

- When it rains the rainwater will collect in the bottom of the bottle.
- After it rains carefully measure the amount of water in the container. Measure in millimeters.

EXTENSION:

- Keep a record of rainfall in your area for at least two months. It will be best to do this activity during the rainy season or you may get no rainwater at all!
- Calculate the average rainfall of your area from the data collected over the two months. Your teacher will give you the South African rain fall distribution map and take you through on how it is read. Does it more or less match the average illustrated in the rainfall distribution map?

GLOSSARY OF TERMS:

Groundwater:	Subsurface water in the zone in which permeable rocks, and often the overlying soil, are saturated.
Reservoir:	It is a lake or dam that is used to store water before it is supplied.
Average:	It is the result that you get when you add two or more numbers together and divide the total by the numbers you have added together.
Rain Gauge:	A device that is used to measure the amount or quantity of rainfall.

Water use efficiency

4. Rain, Rain, Stay

ACTIVITY

At the end of this activity you will be able to:

- Design and make a technological device that can be used to solve the problem of wasted rain water.
- Select appropriate resources and develop products in a safe and waste-free manner.

You will need:

- **Wood for supports**
- **A large tub - preferably metal**
- **A tap, if possible**
- **A sheet of wire mesh (with fine holes bigger than the open area at the top of the tub**
- **Nails and screws**
- **Tools**
- **Silicone sealant**

Preparation

NB: You may look through unwanted material at home, school etc. (recycle) or ask your educator to help you write letters to request material from local business people.

ACTIVITY 4A: BUILD YOUR OWN WATER CATCHMENT CONTAINER

- In your groups brainstorm and list materials you'll need to build a water catchment container that:
  - Will catch rainwater.
  - Will not leak.
  - Will be installed out of reach of animals that might want to drink from it.
  - Will keep away small animals like rats, bats etc.
  - Will allow you to drain some water.
  - Will be easy to clean.

- Agree on the date on which the material should be brought to school.

- Develop a plan that details a step-by-step process of building a water catchment container. The purpose of choosing each material or apparatus should be explained as well. These should relate especially to safety precaution.

ACTIVITY 4B: EVERY DROP OF WATER PLAYS A ROLE

Each group must evaluate the water catchment facility they have designed, making use of the following questions as a guide:

1. What could this water be used for?
2. What could they not use this water for?
3. What can be done to make this water suitable for those things mentioned in 2 above?
4. In their case what would they suggest that the water in their water catchment container be used for?
5. Why is it necessary to keep away animals from water used for human consumption?
6. How would they improve or modify the water catchment container?

ASSESSMENT:

Your design will be assessed on the following:

1. The ability to catch as much water as possible.
2. Free of leakages.
3. The safety of the design – (hygiene).
4. Protection from potential damages etc.

GLOSSARY OF TERMS:

Recycling:	To process and re-use materials that have been used before.
Brainstorm:	A technique that involves thinking about a particular problem and writing down as many ideas about it as possible in a short period of time.
Safety precautions:	An action that is intended to prevent something unpleasant or dangerous from happening.

Water use efficiency

5.Use water wisely

BACKGROUND INFORMATION:

We have already looked at some resources and services provided by the government. Let us now look at the very important resource which the government of South Africa provides (water).

Providing water

The Department of Water Affairs and Forestry is a department of the national government. It provides everyone with water. This is a very complicated and an expensive process.

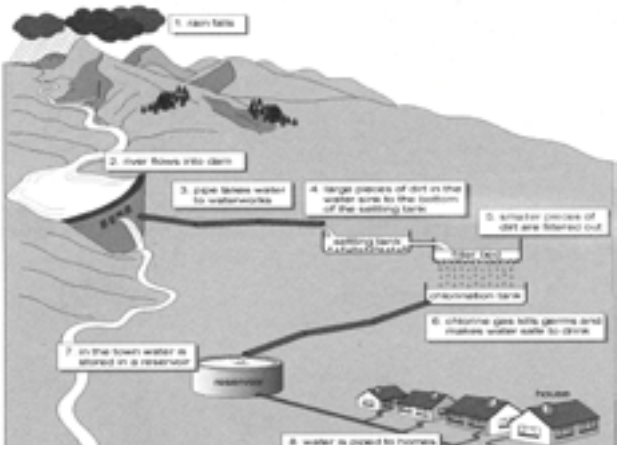
ACTIVITY 5A

THE PRICE WE PAY FOR THE USE AND MISUSE OF WATER

- Your educator will assist you to interpret the two pictures so that you can understand the source of water for each family, how it gets to the two homes as well as the cost involved.

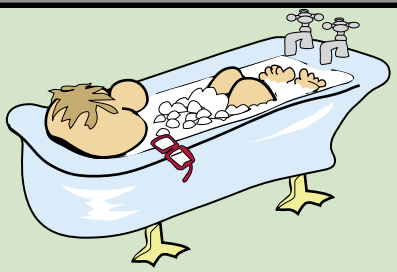
INSTRUCTIONS:

1. The two pictures below show different sources of water used by Paul and Pinky's houses.
2. Study the following pictures and describe how water gets into Paul and Pinky's homes.
3. Which method do you use to collect water at home?

A. How water gets into Paul's house	B. How water gets into Pinky's house
	

ACTIVITY 5B – THE USE OF WATER AT HOME

I. Study the audit report illustrated in the table below and answer questions that follow with your partner.

What do they use for?	Paul	Pinky
1. Bathing.		
2. Washing clothes.		
3. Getting drinking water.		
4. Watering their plants.		
5. Washing their car.		

Questions:

1. Which family gets its water easily? Give reasons for your answer.
2. Which family uses more water? Give reasons for your answer.
3. Which family uses less water? Give reasons for your answer.
4. For the family that uses the most water suggest three changes that they can apply to save their water.
5. Looking at the amount of water used, where and how it is obtained and used as well as the cost of obtaining it, what would you say are the advantages and disadvantages of both families?
6. Write the advantages and disadvantages on the following worksheet.

Family	Paul's	Pinky's
Advantages		
Disadvantages		

ASSESSMENT

In your responses did you list the following?

	Yes	No
Saves time		
Uses clean water		
Easy to get		
Saves water		
Less labour		

WATER QUALITY

Water Quality

6. Water Pollution is bad

ACTIVITY

At the end of this activity you will be able to:

- Identify the different ways in which society destroys the quality of water.
- Suggest some solutions to these problems as a means of reducing the risk of diseases.

YOU WILL NEED:

- **Pen/Pencil**
- **Scribbler**

INSTRUCTIONS

- In your groups read and discuss the fact sheet below.
- You will be allocated a certain section of the main picture.
- In the worksheet look at the section of the pictures allocated to your group and answer the questions that follow.
- You will be asked to make a presentation of your observations using the worksheet.
- You will be assessed on your ability to identify sources of pollution and actions taken to solve the problem.

BACKGROUND INFORMATION: WATER POLLUTION

Water pollution occurs when people dump waste, chemicals, metals and oil into the water. Polluted water is dirty, can smell bad and contain germs or chemicals that are harmful to people, water animal and plant life and can cause diseases. We need to look after our riverbank vegetation. The roots of plants and grass stop soil erosion. Some plants clean water and slow down floodwater.

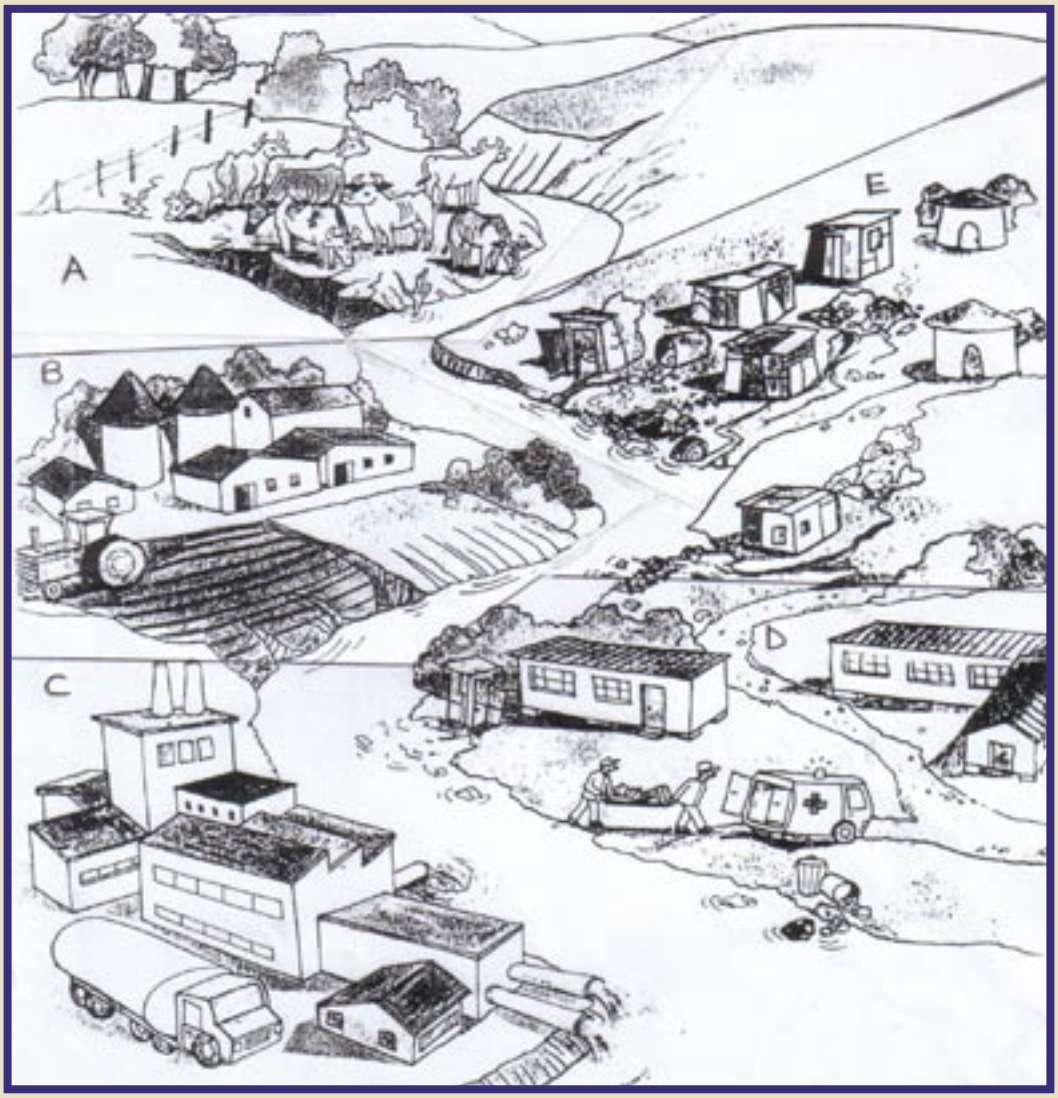
WHAT TO DO:

- Look at the following picture which shows different lifestyles. The main picture is divided into five different pictures showing different activities.
- Work with your allocated sub-picture either a, b, c, d or e.
- You will be divided into 5 groups for the purposes of discussion and presentation.

ACTIVITY 6A

Look at picture A and answer the following questions:

PICTURE A: BEFORE



1. Use the following words to describe the condition of the environment in your picture. Also what impact does the activity in that environment have on the quality of water?

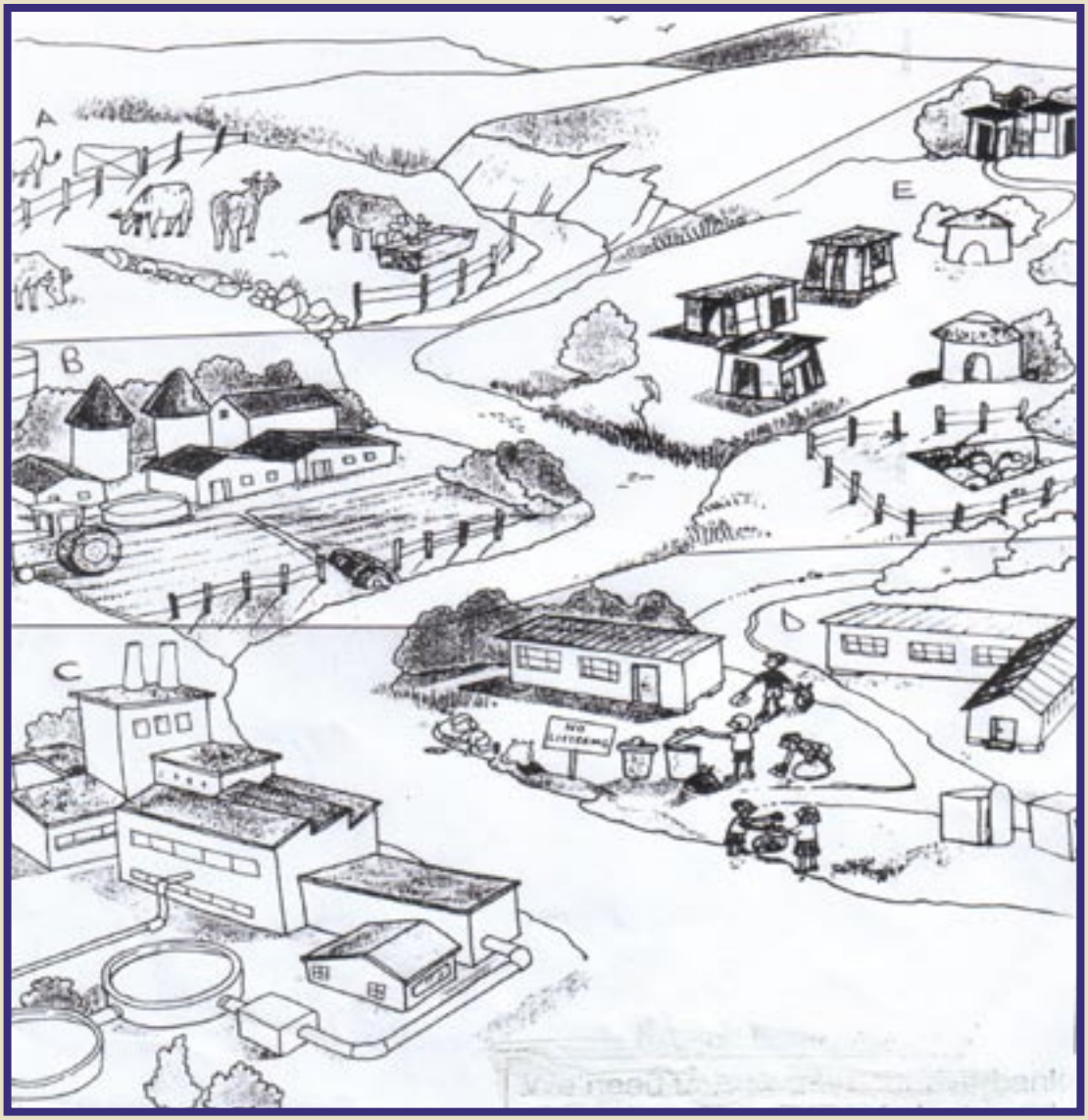
smelly, polluted, murky, clear, good, not smelly, at risk, not polluted, bad, not at risk

This section of the river is ……., the water is probably……. and……..
This means the quality of the water is…… and so the people using it are…… from diseases.

2. The possible source of this pollution is _____
_____
_____
_____
_____

Look at picture B and answer the following questions:

PICTURE B: AFTER



1. Look at your group's section of the river and suggest what action can be taken to improve the quality of the water in your section of the river.

_____
_____
_____
_____

2. Choose the correct word / phrase from the list below and fill in the spaces left in the passage:

Smelly, polluted, murky, clear, good, not smelly, at risk, not polluted, bad, not at risk

This section of the river is now ……., the water is probably……. and…….. This means the quality of the water is……. and so the people using it are…… of diseases.

ACTIVITY 6B

- Prepare a presentation of your discussion using your worksheet.
- Also, suggest an information sharing action project or outreach programme to address similar problems in your local environment.
- Present your discussion in class.

GLOSSARY OF TERMS:

Murky: Water that is dark and dirty that you can not see through it.
Chemicals: A substance used in or resulting from a reaction involving changes to atoms or molecules.

Water Quality

7.Do not pollute water

ACTIVITY

In this activity you will:

- Demonstrate how an average storm drain collects water during a rainfall event.
- How the water from the storm drain can impact on water quality.

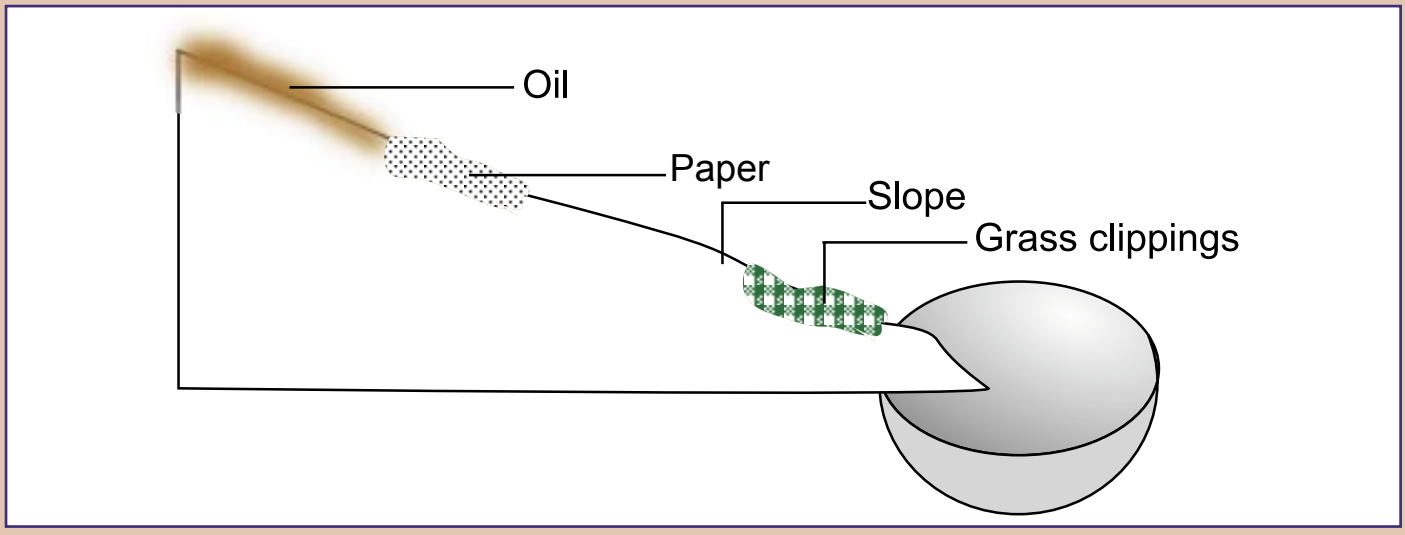
You will need:

- **A watering can**
- **A water bowl**
- **Pollutants e.g. motor oil, fertiliser, soil, grass clippings, shredded paper**
- **Water**
- **Gentle slope**

ACTIVITY 7A – REMOVE THE POLLUTANTS FROM WATER

What to do:

1. Divide yourselves into groups. You need to work outside for this activity.
2. Select any pollutant you want to work with from the ones the teacher will give you.
3. Fill the watering can with water.
4. Place the water bowl at the foot of the gentle slope.



5. Spread the pollutants on the slope.
6. Vigorously pour water on the tip of the slope.
7. Observe what happens.

Questions

- What does water in the bowl look like before being mixed with pollutants?
- How do you think pollutants damage the environment?
- How do you feel about what happened?
- How can this type of pollution be stopped?

Extended Activity

1. Share with other groups what happened in your group.
2. Suggest ways in which we can remove the pollutants from water.
3. Try some of the removal methods you have suggested.
4. Which pollutants were easy to remove?
5. Which ones were difficult to remove?

What have you learnt?

You have seen how damaging the pollutants in water are. They first decrease the quality of water, and if we drink it we might get sick. There are plants and animals that live in water. They are also affected by this pollution. Have you noticed how long it takes to try and remove the pollutants from water? Think about it on a bigger scale. If a dam, a river or a well we get our water from is polluted and needs to be cleaned, how expensive do you think the exercise will cost?

ACTIITY 7B- THE EFFECTS OF WATER POLLUTION

Water pollution is one of the dangerous things in the environment. It mainly disturbs the environment, particularly living things found in water.

In this activity we shall:

- Discover the effects of water pollution.
- Suggest ways to prevent water pollution.

What to do:

- Study this picture carefully

(a) Explain what is happening in the picture.

(b) Spot the dangers that result from this action.

(c) Mention the things that could be damaged or destroyed by this situation.

Glossary of Terms

Pollutant - A substance that pollutes, usually the chemical waste of an industrial process.

Impact - The effect or impression made by something.

SANITATION, HEALTH AND HYGIENE

8. Caring for the environment we

GUIDELINES FOR THIS LESSON:

- This project / activity is divided into 3 activities, each with several steps.
- The progress of each step will be monitored and properly supervised by the educator.
- It will take a week or two to cover all the sub-activities of this project.
- The information gathered should give you insight and a basis for suggesting reasonable solutions to the health problems identified in certain types of settlements.
- The kind of work can open door to careers as researchers and environmental health officers.
- Each learner will do the survey individually, but the results will be combined and reported as a group.

You will need:

- **A magazine to cut pictures of settlements**
- **A letter**
- **An environmental checklist**

ACTIVITY 8A: SANITATION PRACTICES

- Bring magazines from home and cut out pictures of different settlement types from the magazines. (Educator may supply magazines).
- Choose one picture of the settlement type you are going to investigate and paste it in the cover page of your project.

ACTIVITY 8B: PROJECT ON A HEALTHY AND CLEAN ENVIRONMENT

In this activity you are going to conduct research to determine the environmental problem identified in a particular community by visiting the local clininc to gather the information about the frequency of cases reffered or treated at the clinic.

STEP 1: Obtaining information from the local clinic or nurse.

INSTRUCTIONS:

- Give this letter to the nurse of the clinic nearest to the area you are surveying.
- Leave the letter with a nurse and collect it on the date agreed upon.

Dear nurse

The learners of…….. school are investigating the impact of poor sanitation practices in your area. Would you kindly assist them by visiting our school and provide the school with the following information?

1. *Which group makes up the majority of patients, visit your clinic each day?*

Old people	Middle age	Young people

2. *Which gender visits the clinic frequently?*

3. *How many young people visit the clinic for sanitation-related practices?*

Cholera	Dysentry	Bilharzia

- Analyse the results from the nurse.
- Identify the problem caused by poor sanitation in your area.

DATE OF SUBMISSION:……..

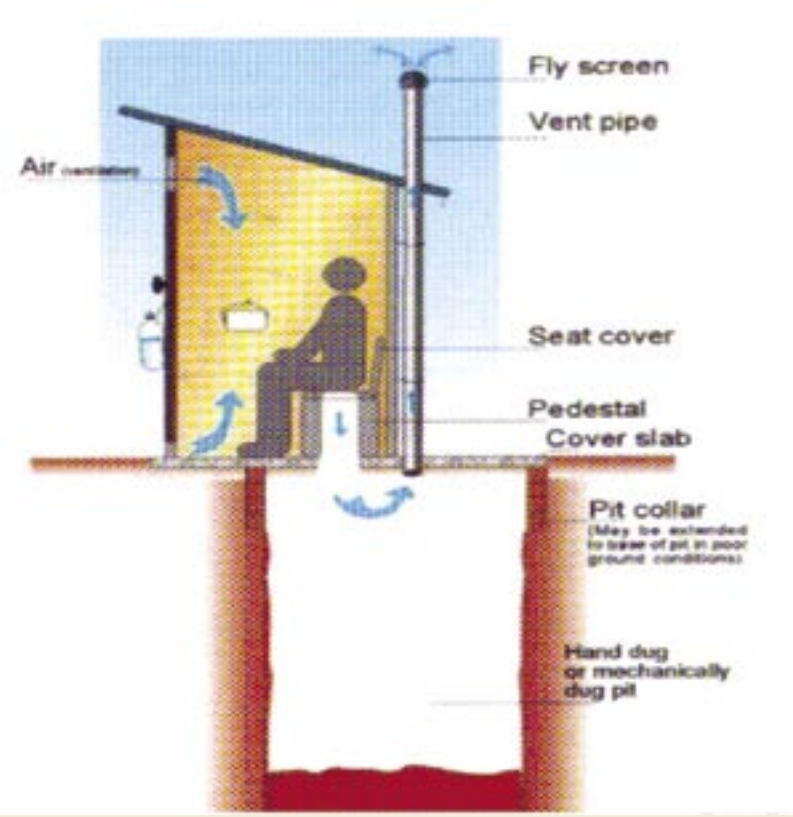
STEP 2: CONDUCTING INTERVIEWS

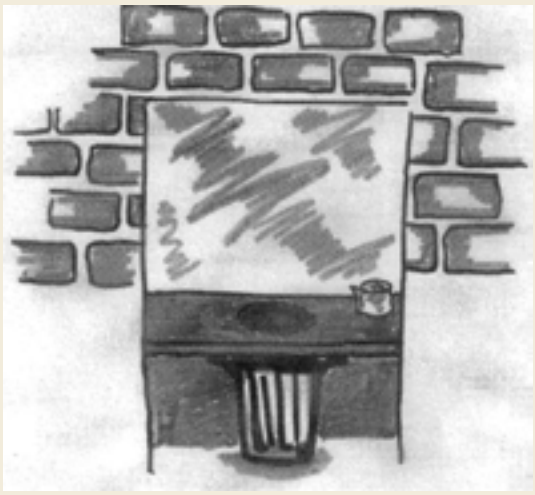
INSTRUCTIONS:

- Sample five families from the area.
- Find out the causes of the health problems identified in your local environment by doing the following survey.
- Your survey should be conducted in the same type of settlement.

1. Circle the type of settlement you are surveying:
   a) Township
   b) Informal settlement
   c) Village
   d) Suburb

2. Which of the following toilets are used in the area you observed? Tick the one observed.





3. Interviews:

- Interview one person from each of the different families you are surveying to find out if they have suffered from illnesses related to poor sanitation practices.

	YES	NO
1. Has any member of the family suffered or is suffering from diarrhoea or food poisoning?		
2. Does it happen more than twice a year?		
3. Do your neighbours also suffer from these diseases		

DATE OF SUBMISSION:……..

STEP 3: SURVEY ON THE USE AND CARE OF TOILET FACILITIES

- Below is a list of good and bad sanitation behaviours with regard to use and care of toilet facilities.
- Use 5 toilets for the purposes of this observation.
- Of the five toilets you observed, write the number of toilets in which you observed.
- Evaluate if you think it is a positive (✓) or negative (x) thing to do and indicate in the appropriate column with a tick or a cross.
- **NB**: Two columns will be filled in at this stage, column 1 and 3

No.	Physical condition	✓ / X	Rating
	Clean toilets		
	Dirty toilets		
	Smelly toilets		
	Broken toilets		
	Toilets with hand washing facilities		
	Toilets without toilet paper		
	Soap to wash hands available		
	Toilets with flies in or around them.		
	Rubbish bins available in the toilet		
	Privacy when using the toilet		
	Someone leaving the toilet without washing their hands		
	Toilet with litter inside (e.g. tins, plastic, food etc)		
Rating with the highest number			

DATE OF SUBMISSION:……..

STEP 4: OBSERVATION OF ENVIRONMENTAL CLEANLINESS AND PERSONAL HYGIENE

- Observe the **environmental cleanliness and personal hygiene** in the area around the houses you are surveying.
- As you observe each of the following, write the number in the first column. You do no not necessarily have to observe five instances of these; it can be more or less than five.
- Evaluate if you think it is a positive (✓) or negative (x) thing to do and indicate in the appropriate column with a tick or a cross.

NB: Two columns will be filled in at this stage, column 1 and 3

No		✓/ X	Rating
	Litter lying around		
	Uncollected rubbish		
	Dustbins covered with lid		
	Food left uncovered		
	Someone eating without washing their hands		
	Animals allowed to eat and or drink from human food and water supply		
	A dirty child / child with runny nose		
	Flies		
	Dead animals lying around		
	Patches of dirty stagnant water		
	Person urinating / child defecating outside the toilet		
	Drinking water kept in a covered container		
	Rating with the highest number		

DATE OF SUBMISSION:……..

STEP 1: INSTRUCTIONS:

- Collect your projects from the educator.
- Correct the second column of the environmental checklist indicating bad or good physical condition.

STEP 2

INSTRUCTIONS:

- Take the rating with the highest number, used by the majority of the group as the overall rating for your settlement type.

  For example if 3 out 5 members of a group have the highest number of OK's in the use and care of sanitation facilities checklist = OK on the group rating scale.

- Use that rating to fill in the rating for your settlement type in the appropriate column of the group rating scale below.

GROUP RATING SCALE: (Use ok /not so high/ high)

How do you rate the:	Village	Informal settlement	Township	Suburb
Occurrence of diseases in the…… (Activity 2, step 1 results)				
Use and care of sanitation facilities (Activity2, step 3 results)				
Environmental cleanliness and personal hygiene (Activity 2, step 4 results)				

ACTIVITY 8D: GROUP DISCUSSIONS:

INSTRUCTIONS:

Discuss the following in your groups and nominate one speaker to present your discussion to the whole class.

1. Is your settlement type at risk of contracting diseases? Yes / No.
2. State the reasons why those people are / are not at risk of becoming ill.
3. For those who are at risk, suggest what they can do to prevent themselves from becoming ill.

GLOSSARY OF TERMS:

Settlement:	A place where people have come to live and have built homes.
Survey:	To try to find out detailed information about a lot of different people or things, usually by asking a lot of people a series of questions.
Sanitation:	A process of keeping places clean and healthy, especially by providing sewerage systems and clean water supply.
Communicable diseases:	A contagious or infectious disease that can be passed from one person to another.
Diarrhoea:	It is a sickness, which makes one's body lose a lot of liquid in the form of liquid faeces.
Stagnant water:	Water that is not flowing, and therefore often smells unpleasant and is dirty.
Urinating:	Getting urine out of your body through genitals.
Defecating:	Getting feaces or stools out of your body.

9. Water-related diseases

ACTIVITY

In this lesson you will be able to:

- Show understanding of oral text by responding appropriately to questions asked and connects the story to personal life.
- Explain and communicate to others, symptoms and causes of locally occurring disease as well as prevention strategies.

BACKGROUND INFORMATION

The human right to water entitles everyone to sufficiently and physically accessible, safe and acceptable water for personal and domestic uses. Inadequate water and sanitation are primary causes of diseases such as cholera, typhoid, malaria and dysentery and diarrhoea.

Read the following articles and answer questions that follow:

ARTICLE 1

Cholera is one of the common diseases that affects many people particularly children under the age of five. At least 1.8 million people die every year from diarrhoeal disease, including cholera. About 88% of diarrhoeal diseases can be attributed to unsafe water supply, inadequate sanitation and poor hygiene.

Unsafe water supply can be attributed to various sources like drinking water from the fountain, direct from rain, water from the drums. Swimming in dirty water is equally dangerous since it can cause a disease called dysentery. This is a disease that mainly affects boys. The symptoms are diarrhoea with blood. Blood can also be observed in the urine.

Improved water supply, sanitation, hygiene education and improvements in drinking water quality through household water treatment can help reduce diarrhoea.

ARTICLE 2: CITY PRESS SEPTEMBER 11 2005

Precautions to avert typhoid fever infection.

TYPHOID fever is a bacterial infection caused by Salmonella typhi. This bacterium infects only humans and does not come from animals. The bacterium is transmitted by the faecal-oral route and can also be found in urine. People can become infected by eating food contaminated by someone with typhoid fever, by ingesting water contaminated with human sewage or by direct contact with the faeces or urine of a person who is ill with typhoid fever or is a carrier of Salmonella typhi in their gut.
Symptoms of typhoid fever can be mild or severe. These include a flu-like illness with fever, malaise, loss of appetite, headache, constipation or diarrhoea. Most people will show symptoms within one to three weeks after they have been exposed. Typhoid fever can be effectively treated using specific antibiotics and the fatality rate is low with effective treatment. To prevent infection use safe water and wash hands after using the toilet and before handling food.

- *Source: The Epidemiology and Outbreak Unit, National Institute for Communicable Diseases.*

ACTIVITY 9A – KEEP AWAY FROM GERMS

- Divide yourself into groups.
- You may be 4 in the group.
- Read article 1 and 2 as a class and look up for meanings of unfamiliar words and phrases in the dictionary.
- Write them in this worksheet 1.

Unfamiliar Word	Meaning

- As a group, discuss the symptoms of each of the diseases you read about.
- Complete the worksheet 2.

Disease	Symptoms

ACTIVITY 9B – CLEANING WATER

Extended Activity

1. Brainstorm with your group members on the methods that could be used to clean water from:

    - The fountain.
    - Rain.
    - Drums.
    - Dirty water.

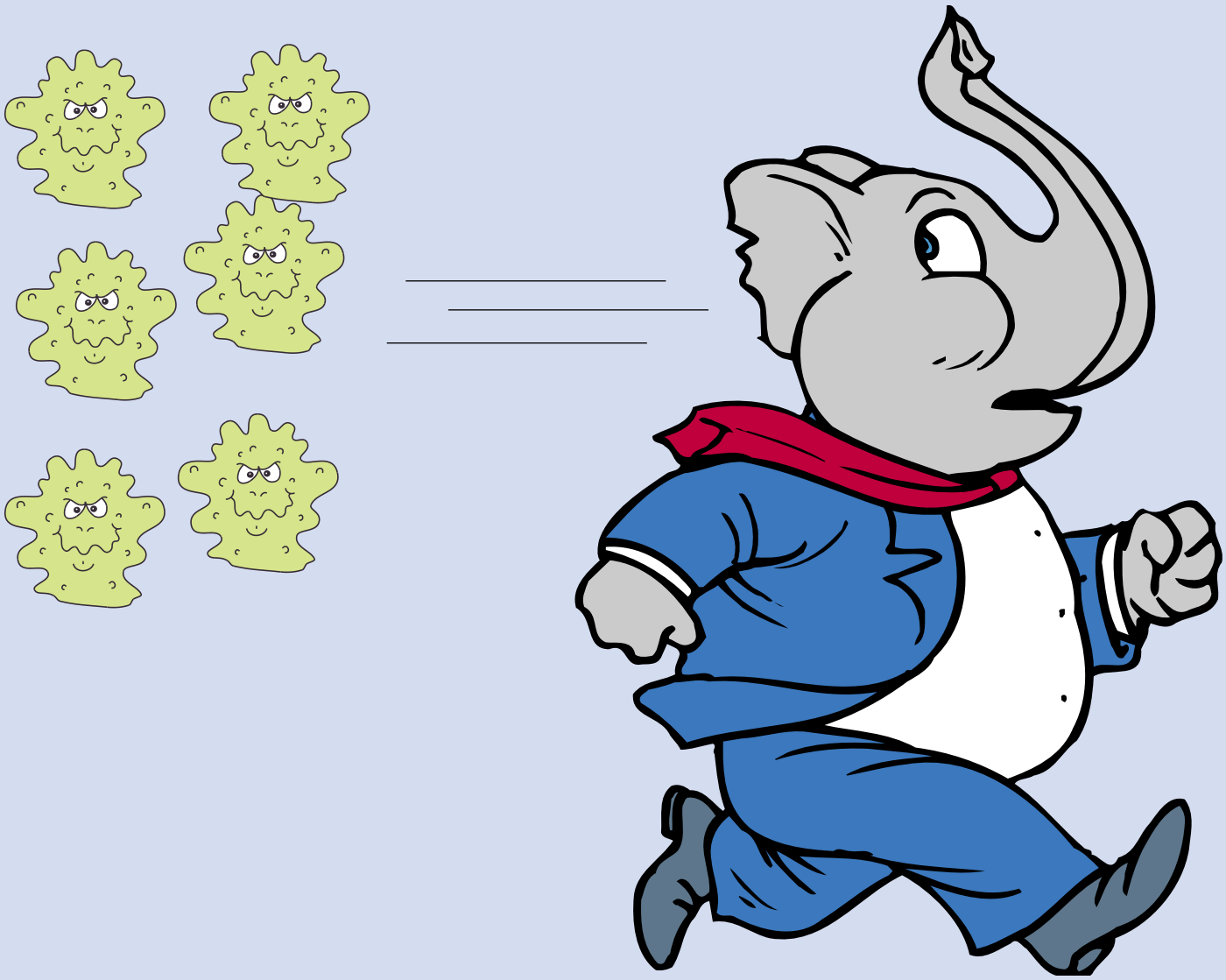
2. Leaving water for more than 3 weeks can cause water to have tadpoles.
3. Can that water be still used? Suggest ways to purify it.

ACTIVITY 9C – ROLE PLAY

- Your educator will read and explain the background information about communicable diseases.
- In pairs, select one of the water diseases and write a summary on the following sub topics.

    - What is that disease?
    - What are its causes?
    - What are its symptoms?
    - How can it be prevented?

- Together with your partner improvise (make up) a conversation, role-playing a scenario about one of your school mates being absent from school and is suspected of suffering from the disease chosen. In your conversation you must cover all points covered in the summary.
- Present your role-play to the class while your classmates assess your performance.
- The best role-play will be chosen and used to take the message to the public.
- Discuss the best venue/s to act out your play. It should be a place where there are lots of people (e.g. a queue in a local supermarket, clinic, public tap, spaza shop, etc.)
- Your educator will give you instructions on how to act your drama.



WATER SAFETY

Water Safety

10. How to tread water

ACTIVITY

In this activity you will be able to:

- Practice some important water safety skills.

BACKGROUND INFORMATION

HOW TO TREAD WATER
If you are able to swim, practice the following skills with a friend. If you cannot swim ask a teacher or lifeguard at a public swimming pool to help you. (Show him/her the pictures in this book). If you become tired when swimming or playing a water sport you can tread water to conserve energy. Practise this skill so that you can do it with minimum effort. This is what you do:

You will need:

- **Paper**
- **Kokis**
- **Scissors**
- **Old doll**
- **stopwatch**

Pedal your legs under the water, as if on an imaginary bicycle to keep yourself afloat.

Keep your feet at right angles to the surface of the water.

THE RECYCLING METHOD

1. Get into the water. Ask your teacher or lifeguard to stay close to the side of the pool.

- Hold out your hands. They should be 15 to 22cm beneath the water. Hold your palms down, with your hands in a cupped position.
- Your hands should be extended a little bit beyond each shoulder, in front of her chest. (Imagine that you are stroking a dog). You will feel pressure on your hands.
- Practise treading water continuous but slowly.
- Remember to keep your head in a relaxed position above the water.

2. To do the leg movements, pretend that you are riding a bicycle by moving your hands in a circular motion beneath the water.

- Keep your feet at an angle of 90 degrees to your shin.
- Keep the movement slow.

3. Now practise doing the arm and leg movements together.

Ask the life guard to help you as you practise.

ACTIVITY 10A – Practising treading water

You can work in pairs for this activity.

1. Practise treading water with your partner.

(a) Observe your partner treading water. Use the above pictures to make sure he/ she is doing it correctly.
(b) Now let your partner observe you as you tread water.

2. For a bit of fun, use a stop watch to see who can tread water the longest.

Some basic rescue skills

If you ever go swimming and someone gets into difficulty in the water, this is what you can do to help:

1. If the person is close to the water's edge, find a pole or stick which the person can grab onto to pull themselves to safety.

    - Before you do this, attract the person's attention by waving your hands and shouting out. Make sure the person looks at you and keeps their head above water.
    - Decide quickly what you are going to use to reach to the person, like a strong stick or pole.
    - Lie on your tummy at the edge of the water with your legs slightly apart. If someone is with you, get him/ her to hold onto your feet and to place their weight over your legs.

2. Give clear instructions to the person in the water. As soon as the person has taken hold of the pole, pull it gently towards the side. If you need to help him out, wait until he is close to the edge shore and then grab the back of his wrist.

How to resuscitate a person

Resuscitate- (re-sus-ci-tait) means to revive or 'restore to life' an unconscious person. If someone is pulled unconsciously out of the water he is resuscitated.

One day, you might be required to resuscitate an unconscious person so it is useful to know what to do and how to do it properly.
Here are few steps to help you practise the technique of resuscitation:

Step 1
Lie the person on their back. Tilt their head sideways and clear the mouth.

Step 2
Tilt the head back.

Step 3
Pinch the nose and cover the mouth completely, sealing it with your mouth. Now blow out.

Step 4

Watch for the rise of the chest and, as you remove your mouth, listen for the air being expelled (breathed out).

Repeat the blowing in for as long as is necessary. Never give up. Keep the person warm and watch them all the time until medical help arrives. Practise the resuscitation technique with a friend or partner until you feel comfortable with it. Remember that this technique could help you save someone's life.

ACTIVITY 10B – PRACTISING RESUSCITATION

(a) Draw pictures of each step in the resuscitation technique on separate pieces of paper.
(b) Cut out each drawing.
(c) On small cards, write the description of the four steps.
(d) Now juggle the pictures and your action words.

- First give your partner a chance to unscramble the cards and action words. Use a stop watch to see how fast and accurately your friend does all four steps.

SAFETY TIPS

1. If you are within distance of trained help (a nurse, a doctor, a hospital, a clinic), phone or call for help and direct the life saver to the person in need.
2. If you are alone, try to reach the person from the shore by pulling him to safety without letting yourself be pulled in.
3. To help a lifesaver in a rescue situation, stand on the shore as a marker, constantly pointing to the person in distress.
4. Keep calm.
5. Realise your own limitations. Don't try to do things you are unable to do.
6. Act quickly.

FORESTRY AND IAP'S

11. Types of Trees

ACTIVITY

In this activity we will:

- Look at the classification of trees according to the origin, season and botanical.

YOU WILL NEED

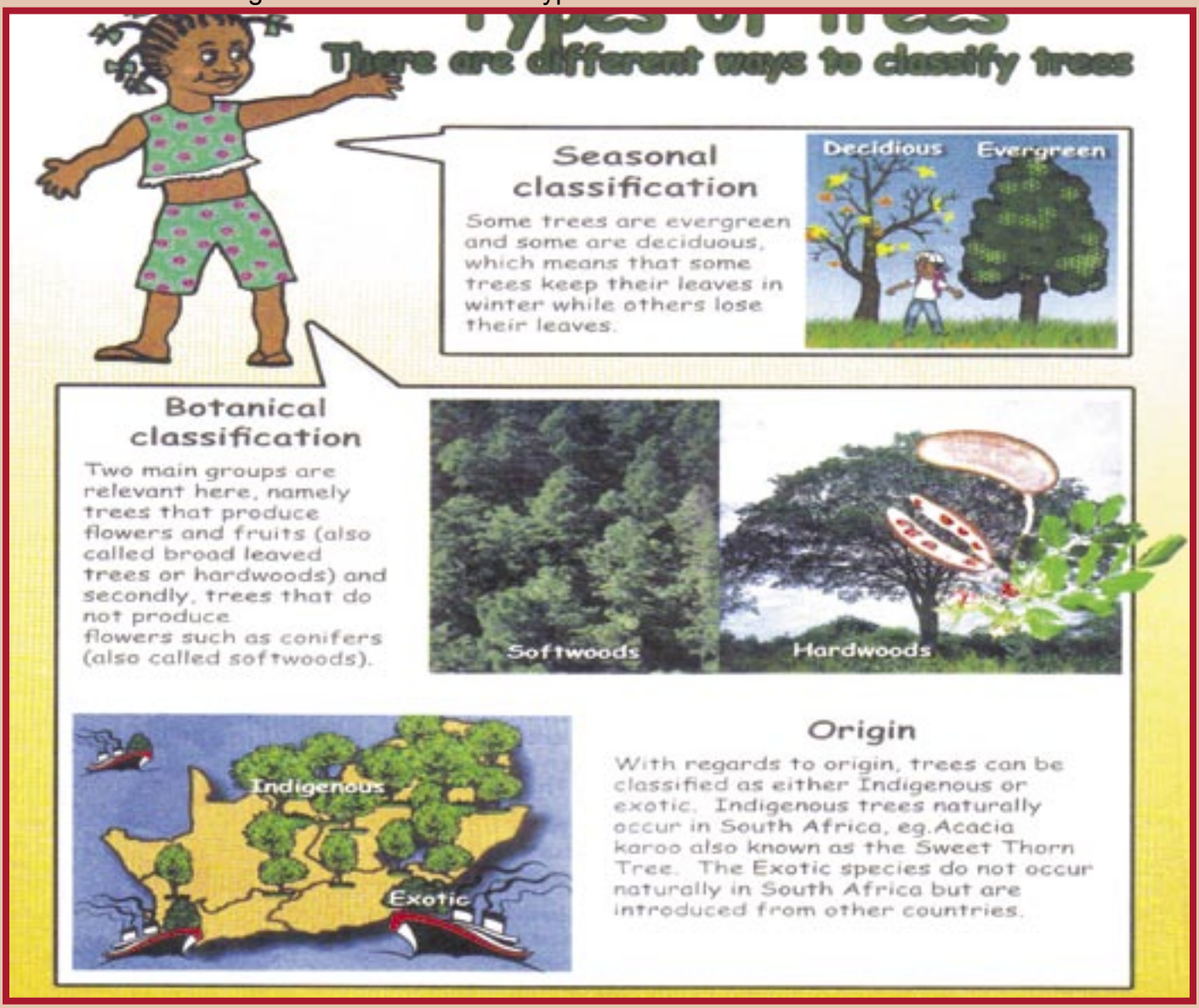
- **Pictures of different trees.**
- **Information brochure**

ACTIVITY11A

CLASSIFICATION OF TREES

What to do?

1. Read the following information about the types of trees



Complete the following worksheet to summarise the classification of trees.

Classification	Origin	Seasonal	Botanical
Main groups	(i)_____ (ii) _____	(i) _____ (ii) _____	(i) _____ (ii) _____
Description (what are they)	(i) _____	(i) _____	(i) _____
Examples.			

ACTIVITY 11B

POSTER ABOUT CLASSIFICATION OF TREES.

1. Collect as many pictures of tree cuttings
2. You may obtain your pictures from the newspapers, Department of Water Affairs & Forestry or you may even take photos of trees.
3. Your poster must show the following:
    - Classification.
    - Main groups of the trees.
    - Description.
    - Examples.

ASSESSMENT

Your poster will be assessed based on the following:

- Classification.
- Main groups.
- Descriptions.
- Examples.
- Legibility.
- Attractiveness.

Forestry and IAP's

12. Our role in the fight against invasive Alien Plants

ACTIVITY 12A

- Read the following background information, on what threats do these invasive alien plants pose?

Role play:

Find solutions to the problems posed by IAP's from the perspective of various role players.

You will need:

To divide yourselves into seven groups.
Write the identities on the leaves of a branch taken from an invasive alien plant/tree, and allow a member from each group to pick one leaf (i.e. an identity).

What threats do these invasive alien plants pose?

Invasive alien plants pose one of the greatest threats to the natural ecosystems of the Cape Peninsula. These plants are disrupting the ecology of natural ecosystems, displacing indigenous plant and animal species, and degrading the Peninsula's unique and diverse biological resources. Aggresive invaders reduce the amount of light, water, nutrients and space available to indigenous species, alter hydrological patterns, soil chemistry, moisture-holding capacity and erodibility, and change fire regimes. Some invasive alien plants contain toxins that may be lethal to certain animals. In some cases, invasive alient plant invaders are driving our rarest species closer to extinction. Effects such as these have direct and indirect economic costs. For example, alien invasions not only reduce the ecotourism potential of fynbos landscapes, and the amount of land available for agricultural purposes, but also deplete the potentially expoitable genetic stock of wildflowers and medicinal plants. And management of these species is expensive. Invasive plants cause great economic losses and expenditure each year, measured in billions of rands, for agriculture, forestry, grazing and roadways management.

The Peninsula fires of January 2000 provided dramatic evidence of the destructive effects of invasive alien plants. If it wasn't for the invasive alien plants, the fires would have been more manageable. It has been clearly demonstrated that all houses damaged and destroyed during these fires were as a direct consequence of dense stands of invasive alien plants surrounding properties. In addition, the intensity of fires is significantly higher in alien invaded areas and causes substantial environmental damage. As a result the soil alters in such a way that it actually repels water and becomes prone to erosion by wind and water. Roots, seeds of indigenous vegetation and other organisms in the soil are destroyed and damaged, and the landscape battles to recover. In the first major downpour after a fire, tons of soil from the burned areas pours like muddy soup into streets and homes surrounding the mountain slopes. Many homes suffer thousands of rands of damage. In uninvaded fynbos however, erosion seldom occurs after fires because the natural landscapes have had thousands, if not millions, of years to co-evolve with fire.

Perhaps the most important threat of all is that of alien plants on the water yield from mountain catchments, springs and vleis. Dense stands of invaders may reduce water yield in these areas by as much as 50% in extreme cases. In the water-starved lowlands of the Cape Metropolitan Area, this is a serious matter and seriously affects our socio-economic well-being.

OUR ROLE IN THE FIGHT AGAINST INVASIVE ALIEN PLANTS

The Cape Peninsula, some 470 km^2 in extent, is recognised as one of the world's most prominent "hotspots" of plant diversity. The Peninsula has more than 2 285 species of plants – more than the entire British Isle (1 492 species) and New Zealand (1 996 species). Of these, 90 are considered endemic (i.e. occur nowhere else in the world). This natural trove is, however, threatened by the persistent spread of invasive alien plants.

Why are invasive alien plants a problem?

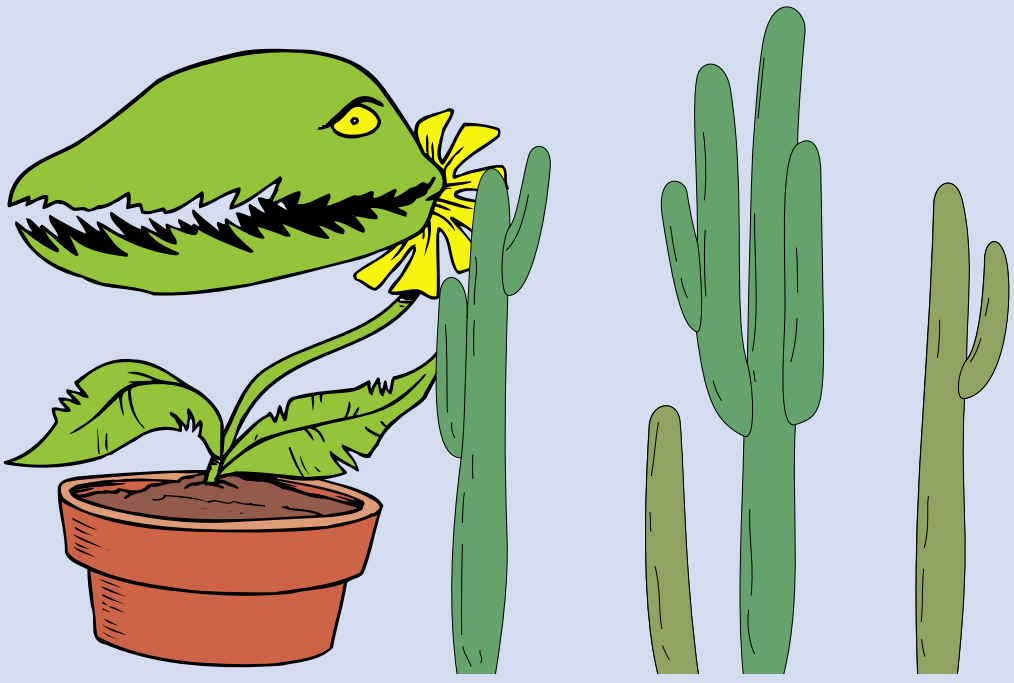
Invasive alien plants are highly adaptable, vigorous growers that easily invade a wide range of habitats. Thus, invasive alien plants are a major threat to the biodiversity and economy of the Western Cape, as they:

- Increase the intensity of wild fires by greatly increasing the fuel to burn
- Consume large amounts of water (3.3 billion cubic meters more than indigenous plants)
- Displace indigenous fynbos species and impact on biological diversity
- Invade land better used for crops and livestock grazing, and
- Increase the speed of water run-off which can lead to erosion and flooding

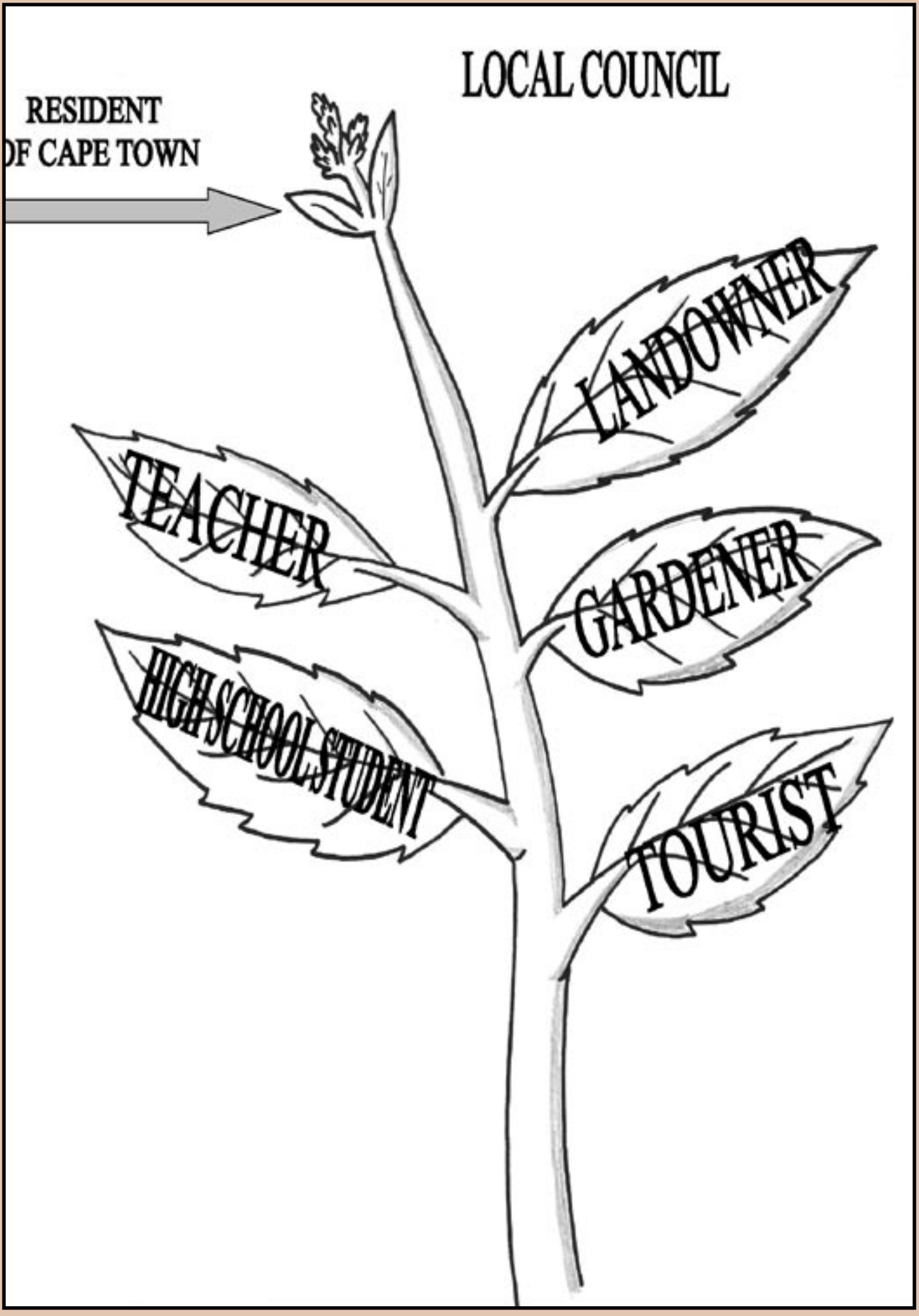
Role-play Activity

Question: I live on the Cape Peninsula – what can I do to curb the threat posed by invasive alien plants?

Your group is assigned an identity (a landowner, a gardener, a high school student, a teacher, a tourist, the local council, or a resident of Cape Town) and you need to compose an answer to the above question from your perspective (the role you chose).



In your group discuss your response to the question and report back to the whole class.


LOCAL COUNCIL
RESIDENT
OF CAPE TOWN
LANDOWNER
TEACHER
GARDENER
HIGH SCHOOL STUDENT
TOURIST

Role Play Assessment Instrument

RUBRIC

Assessment Criteria	Performance Indicator Levels			
	0	1	2	Comment
Group work	Conflict between members	Not all members participated	Effective group work and good group spirit	
Use of background information	None used	Reference to one resource	Reference to more than one resource	
Report back	Shows no understanding of the question	Shows partial understanding of the question	Shows understanding of the question	
Awareness and recognition of environmental problems	Unaware of environmental issues	Aware of issues but does not engage with them	Interested in resolving environmental problems	
Creativity	Lacks creativity	Elements of creativity	Very creative	

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