

Week 3Water pollution

Day by Day pg. 95-97

South Africa is a very dry country compared to the rest of the world. The average annual rainfall for South Africa is about **464 mm** (compared to a global average of **860 mm**). Rain is unequally distributed in South Africa. If you live towards the **western parts of South Africa you only receive rain a few times per year**. The **eastern parts of South Africa receive rain regularly**.

The earth is 70% water, but only 30% is fresh water which we can drink. This fresh water is shared amongst people and animals. As the population grows there is more pressure on the water resources. The activities of people is making it difficult for to keep the quality of water in the rivers and oceans in a good state, this has negatively impacted of the **water quality**.

V – **Water Quality** – how **clean** and **accessible** water is.

Water pollution (video)
<http://www.youtube.com/watch?v=QqNUTIY5foQ>

Water pollution takes place when **pollutants** have been added to the water and thus making the water difficult to consume.

V – **Water Pollution** – the **contamination** (making something dirty) **of water bodies** (a stream, river, lake, ocean), usually as a result of human activities degrading water quality and rendering it toxic to humans or the environment.

- Water pollution **affects drinking water**.
- People can catch **diseases and die** from drinking polluted water. **Cholera** and **diarrhoea** are common diseases caused by polluted water.
- Keeping our water clean is important for our health. Everyone can get involved in dealing with water pollution.

Activity 1

Design an A4 poster to encourage everyone to keep our water clean.

- Brainstorm ideas about a poster.
- Write down or draw these ideas.
- You must have a **slogan**. A slogan is a short phrase used in advertising.
- Make your poster visual with not too much writing.

V – **Pollutants** – substances (or objects) that **do not naturally belong in the water** and are **harmful** to us and to the environment.

Pollutants come in 3 forms:

1. **Insoluble pollutants:** these are **things that do not dissolve in the water** but make it dirty. e.g. oil, garbage, and toilet waste (sewage).

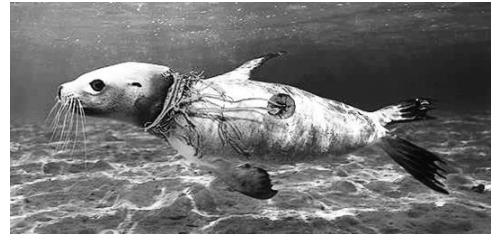
Oil Pollution



Oil can also pollute large amounts of water, from oil spills, routine shipping, run-offs, and dumping. Oil spreads as a thin layer on top of water. Oil spills can be a problem for marine life, the oil kills wildlife and plants that depend on the water body. Oil makes the water undrinkable and it is impossible to remove all of the oil once it is in the water. The oil cannot dissolve in the water and it forms a thick sludge on the surface of the water; this also blocks sunlight and kills the marine plants and prevents **photosynthesis**.

Plastics, Paper and Food Waste (rubber, tins, cans, glass)

Plastic is the most common substance that washes up on beaches and riverbanks. This is because it is the most commonly used material (made from oil), it is light and floats easily and it is **non-biodegradable**. This makes it dangerous for sea creatures as they try to eat it. These items take a long time to decompose.



Solid Toilet Waste

Many people use rivers and streams as toilets. The solid toilet waste cannot dissolve in the water and certain bacteria are needed to break it down.

2. **Soluble pollutants:** these are **chemicals and poisons** that dissolve in water and make it dirty. e.g. soap, fertilisers, insecticides/pesticides/fertilisers.

Chemical pollution

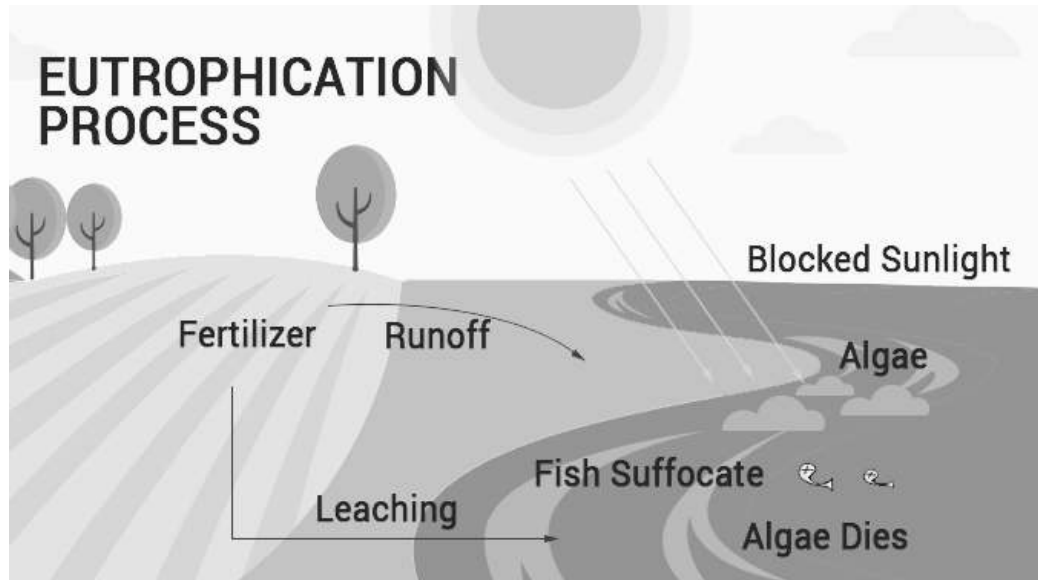
When farmers fertilise the fields and spray the crops, when people use pesticides and weed killers in their gardens or when people wash their clothes or dishes. The chemicals are gradually washed by rain into groundwater or surface water. The effect of these pollutants is to **poison the water** so that nothing can live in it. It can also cause another problem called **eutrophication**.

Eutrophication is already taking place in the **Hartebeespoort Dam**, Gauteng. Making it difficult for other animals and plants to live in the water.



VIDEO: <https://www.youtube.com/watch?v=vfvcqeTsFt4>

V – **Eutrophication** – when small plants called **algae grow** and feed of the fertilisers, soaps and even some chemicals. The **algae grow very fast and turn the rivers and lakes green**. The water cannot be used for drinking. Some algae secrete poisons that make the water poisonous. When the algae die, they sink to the bottom of the river or lake. They decompose and that process uses up all the oxygen in the river.



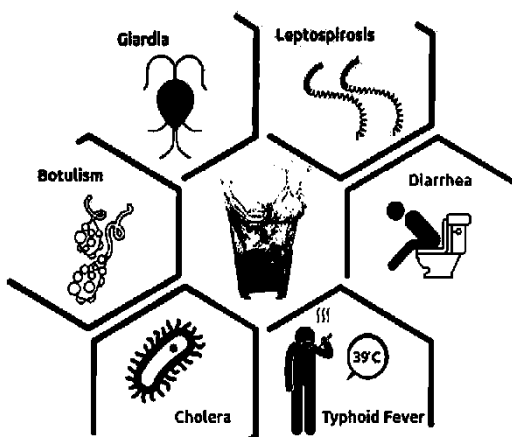
Industrial Pollution and Rainfall Pollution

Factories and mines generate a lot of waste water. The waste water contains a lot of toxic substances like acids and metals. When these substances make their way to water bodies, they poison many aquatic life. Factories can also cause the rainfall to become polluted; this kind of rainfall is called **acid rain**. This rain is caused by the smog that is emitted by factories. When chemicals like **sulfur dioxide** and **nitrogen oxide** mix with the water particles in the air it creates an acid. Acid rain affects the aquatic life and can also corrode buildings and statues.

3. **Living germs** (bacteria) that can **cause people or animals to get sick**.

Germs are living creatures that cannot be seen with the naked eye. Even clean looking water can have germs. Germs cause diseases and cause people to become ill.

Diseases carried by water:



Diarrhoea causes a person to lose lots of water. They cannot eat food and become very weak. The most common cause of death among young people is diarrhoea. The diarrhoea germ is common in areas where there are no proper toilets. The sewage from people is washed into rivers. People drink the water and become ill. This forms a **cycle of infection**.

To avoid contracting diseases that are transported in water, do the following:

- Do not play in or drink polluted water
- Wash your hands with soap before eating
- Report broken toilets

Activity 2

1. What are the three main categories of pollutants found in water? (3)
2. Which category of pollutants would you be able to see with the naked eye? (1)
3. Which categories of pollutants would you not be able to see with the naked eye? (2)
(1)
4. How do you think insoluble pollutants end up in water? (1)
5. How do you think soluble pollutants end up in water? (1)
6. How do you think bacteria that cause illness like diarrhoea and cholera end up in water? (1)
(1)
7. How do you think oil ends up in the water, especially in oceans? (1)
8. What do all 3 categories of pollutants have in common? (1)

TOTAL: 11