

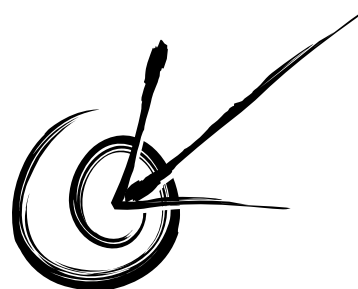


# Down the Drain

## Lesson aims

### What is water pollution and what can you do to stop it?

Students will identify how people's actions affect water quality. Students will understand how choices at play and in the home can reduce this pollution.



## Learning outcomes

### As outlined in the National Profiles:

Studies of Society and Environment	Place and Space	Features of places; People and places; Care of places
	Resources	Use of resources; Management and enterprise
	Natural and Social Systems	Natural systems; Economic systems
Science	Life and Living	Living together; Structure and function; Biodiversity, change and continuity
	Natural and Processed Materials	Materials and their uses; Structure and properties
	Working Scientifically	Acting responsibly





## Background information

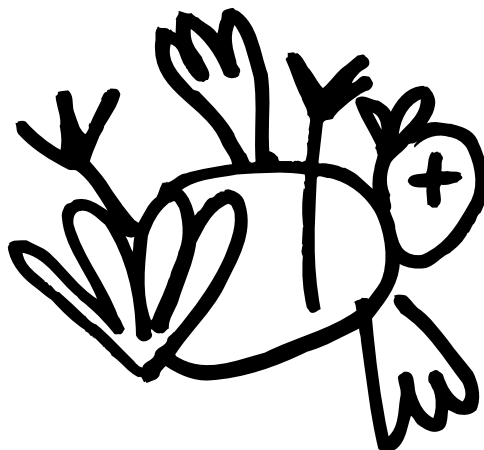
Clean water is important to everyone – for drinking, swimming, growing food, playing, showering and washing.

To ensure we all have access to clean water we need to be careful what we put down drains, toilets and sinks. Things like rubbish, oil, household cleaning chemicals, fertilizers, leaves and grass that end up in the street gutters, flow into the stormwater system. This seriously damages the water quality of our oceans, rivers and streams.

There are three main types of water pollution:

- litter, such as cigarette butts, cans, paper or plastic bags.
- chemical pollution, such as detergents, oil or fertilizers.
- 'natural' pollution, such as leaves, garden clippings or animal droppings.

Sometimes it is easy to tell if water is polluted. Strange odours, taste, or colour are immediate warning signs. It is also easy to see how large amounts of rubbish and erosion of soil can affect the wildlife that depends on the water. However, most water pollution is undetectable through senses alone.



## Did you know?

- Water-borne diseases continue to be a major cause of illness and death in many less developed nations, where more than one billion people drink unsafe water.
- One gram of 2,4-D (a common household herbicide) can contaminate ten million litres of drinking water.
- One gram of PCBs (industrial chemical) can make up to one billion litres of water unsuitable for freshwater aquatic life.
- One gram of lead in 20,000 litres of water makes it unfit for drinking. Older homes often contain plumbing made of lead or soldered in lead, which can then leach into water.
- The nitrates in fertilisers promote excessive growth of algae and larger aquatic plants, causing offensive algal blooms and driving out sport fish.

The most effective way to reduce this problem is to prevent pollution entering the water system in the first place.



## Sources & further information

**ACT Electricity and Water:** Contains educational information and will arrange school visits and tours.  
[www.actewagl.com.au](http://www.actewagl.com.au)

**Blue Mountains People Water Place:** An environmental education project developed for the Blue Mountains provides great classroom resources and information.  
[www.bluemountains.org.au/](http://www.bluemountains.org.au/)

**CSIRO:** Water pollution experiments and activities.  
[www.csiro.au/science/environment.html](http://www.csiro.au/science/environment.html)

**Hobart Water Authority:** Information on water quality and catchment management.  
[www.hobartwater.com.au/](http://www.hobartwater.com.au/)

**Melbourne Water:** Facts about water, lesson plans, online games and quizzes.  
[www.melbournewater.com.au](http://www.melbournewater.com.au)

**NSW Department of Energy, Utilities and Sustainability:** Ideas for what to do to reduce pollution  
[www.deus.nsw.gov.au/water/water.asp](http://www.deus.nsw.gov.au/water/water.asp)

**Power Water:** Northern Territory Water Authority provides simple ways for households to reduce their water consumption.  
[www.powerwater.com.au](http://www.powerwater.com.au)

**SA Water:** Provides a good list of water conservation tips.  
[www.sawater.com.au](http://www.sawater.com.au)

**Streamwatch:** Education and advice for communities to work together for healthy catchments.  
[www.streamwatch.org.au](http://www.streamwatch.org.au)

**Sydney Water:** Heaps of useful information for homework and assignments and plenty of fun games to play.  
[www.sydneywater.com.au/EnsuringtheFuture/WaterSchool/](http://www.sydneywater.com.au/EnsuringtheFuture/WaterSchool/)

**Water Corporation of Western Australia:** Look at the student and teacher section.  
[www.watercorporation.com.au](http://www.watercorporation.com.au)

## Classroom activities



### 1. Introduction

- Prior to taking the students to a local water source introduce the topic and discuss the following questions:

**What** does water do for us?

**Where** does water come from?

**What** would happen if water is polluted? Define polluted.

**Why** is it important to have clean water?

**What** is clean water?

- Put students into groups and assign each group a question. Use newspaper articles, books, the library or the internet to research water pollution. The websites listed would be a good place for students to start.
- Have each group report back to the class and answer their question on water pollution.

## 2. Field trip

- Organise a field trip to a local creek, waterhole, park, nature reserve or dam, and assess how unspoiled or polluted the water is.

- Take:

**Sensible** precautions, and advise the students of suitable behaviour to ensure their safety when working near water

**Transparent bottles** (preferably plastic as these won't shatter when dropped) to get water samples.

**Gloves** in case the water is contaminated.

**Clipboards and pencils** to record student observations on the worksheets.

- Ask the students to write down the items that they see and complete the *Worksheet: Your Local Waterway*.

## 3. Discussion

- Discuss the results of the field trip focusing on the effect of pollution on animals, birds, fish, trees, or whatever else was part of the local waterway.
- Students will then complete the *Worksheet: Pollution – How does your household rate?* to see what activities they can undertake in the home to reduce the amount of pollution entering the local waterway.
- Now discuss with the students what things they could do to clean up their local waterway and keep it clean?



## Extension / Home-based activities

### Lower Primary

#### Before and After

Students can draw a picture of water that is polluted and water that is not polluted. Discuss how the pollution affects the environment.

### Middle Primary

#### Household Guide

Students can design an information handout or pamphlet (aimed at households) about the importance of clean water and informing people what they can do to improve water quality.

### Upper Primary

#### Conduct an Experiment

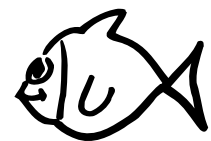
Fill a tray or bowl with water. This represents your local creek or waterway. A funnel represents a storm drain. First, place some of the pollutants into the funnel, holding your finger over the bottom so that they stay inside. Hold the funnel over the 'waterway' and remove your finger. Pour some water on top of the pollutants in the funnel. This is like the rain - washing things into the storm drain. What happened to the water in the bowl? Try the experiment again, this time holding a sieve over the funnel. What happened this time? Did the sieve stop all the pollutants? What kind of pollutants still entered the 'waterway'?

#### Take Action

Students can develop a plan for cleaning up their local waterways. They will need to research what needs to be done to assess the waterway and what can be done to improve the surrounding environment. Invite a local community group/speaker to assist the students. Contact your local council, water authority or local environment group such as Stream Watch for further advice.

# Worksheet: Your Local Waterway

**Draw your waterway here**



# Worksheet: Your Local Waterway

**Draw any rubbish  
you found here**

**Do you think the creek is polluted?  
Why?** \_\_\_\_\_

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**Where are the pollutants  
coming from?** \_\_\_\_\_

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**Describe how the water  
looked and smelt**

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**Draw any animals you saw here**

# Worksheet: Pollution - how does your household rate?

## Instructions

1. Take the checklist home and with the help of an adult answer the questions.
2. Add up the numbers you've circled in each column to find your total.
3. Use your total score to see how you measure up.
4. Return the completed sheet to your teacher for class based discussion.

Does your household (Please circle your answer.)	Never	Sometimes	Often	What alternative is there?
Pour used or left over cooking oil down the kitchen sink?	1	2	3	
Throw away cleaning chemicals in the rubbish?	1	2	3	
Throw away prescription medicines in the rubbish?	1	2	3	
Throw used containers of paint in the rubbish?	1	2	3	
Empty left over paint down the sink?	1	2	3	
Flush rubbish, such as food scraps, down the toilet?	1	2	3	
Use lots of fertilizers on your garden?	1	2	3	
Use environmentally-friendly cleaning products?	3	2	1	
Pick up rubbish you see in your local area?	3	2	1	
Take unused household chemicals and paint to a collection depot?	3	2	1	
Dispose of your household rubbish properly so that it doesn't end up down the stormwater drain?	3	2	1	

**Sub Total**                       +  +

**Total** (add up the sub total columns)                      =

**Check out how you scored over the page.**

## Worksheet: Pollution - how does your household rate?



### How Did You Score?

Score	What your score says about you	What More Can You Do?
11-15	You are to be complemented on your knowledge of water resource issues and your commitment to practising sound water pollution prevention practices.	Keep it up! Educate your friends and family to follow your example.
16-20	You are generally aware of the need to protect our water from pollution, but need to be more consistent in your habits. Remember even small quantities of pollutants can contaminate large bodies of water.	Conduct a home survey with your friends and family. Implement water protection strategies wherever possible and use more environmentally friendly products around the home.
21-30	Unfortunately, like too many others, you could be contributing to severe water pollution problems in your community. You need to think about the many ways that you can change your habits to become part of the solution.	Call the local water authority for more information. Learn about ways to protect water.