

# AS11 - A Catchment Story

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This is a class activity lead by the teacher to examine some of the ways in which waterways can become polluted.

## Syllabus references:

### Outcomes

**Core Content:** 5.11.2 waste from resource use to:

a) relate pollution to contamination by unwanted substances

**Skills:** 5.27 b) demonstrate a commitment to conserving and improving the quality of society and the environment

**Time:** 40 minutes

## A Catchment Story.

### Materials.

A Large Transparent (Glass) Aquarium or similar container.

20 small plastic sauce Tubs say 70 mm diameter, 60 mm depth or similar.

Various materials to represent pollution as outlined in the list attached.

Two large glasses.

Paper towels, filters, scoops, strainers, milk cartons with soil to ensure correct disposal of polluted water and clean up.

### Preparation.

1. Label each of the plastic Tubs with a character's name from the story. Duplicate containers can be prepared to cater for all of the members in the group if necessary.
2. Place or pour the appropriate materials into each tub in accordance with the list.
3. Distribute the labelled tubs to people in the demonstration. Request that they be careful and keep the container closed until they are told to open it.
4. Fill the aquarium with clear, clean water and place in a prominent, visible and accessible position. Float a plastic duck in the water.
5. Introduce the Catchment Story.
6. Fill one large glass with water out of the aquarium, demonstrate its cleanliness and properties by pouring from one glass to another. Leave the glass aside for comparison at the end of the story.

### The People in the Catchment.

Tub	Name	Position	Substance	Amount
1	Dusty Boots	Quarry	Vinegar (acidic groundwater), talcum powder, vegetable oil.	½ Tub
2	Clive Colt	Equestrian Centre	Thick muddy water, horse manure	½ Tub
3	Phyllis Featherstone	Poultry breeder	Broken white chalk, dirty water	
4	Freda Fancy Farm	Market gardener	Baking powder (fertiliser)	½ teaspoon
5	Percy Pipe	Plumber	Cold tea, toilet paper, vegetable oil	½ Tub
6	Wanda Whatnot	Nursery and coffee shop	Cold weak tea/ toilet paper, detergent	Tub cold tea/ toilet paper
7	John and Joy Citizen	New home builders	Sand, salt, food colouring	½ Tub
8	Mike Moneybags	Industry	Detergent, iron filings	1 drop detergent in full Tub
9	Carmel Scrub	Mobile Car Wash	Detergent, dirt and oil	Full tub
10	Perry Putt	Golf Course worker	Vegetable oil, baking powder	¼ tsp
11	The Guzzle Family	Picnicker	Litter	Litter, beer bottles, cans
12	Freddy Fishfingers	Fisherman	Fishing line	Length of fishing line
13	Mrs Thepoint & her two children	Feeding the ducks	Bread, wrapper	Crusts, white feathers, plastic wrapper
14	Danielle Doggears	Dog Owner	Cold tea, rolled wet brown paper.	½ Tub
15	Catchment Co educational School	Students and Staff	Litter, dirt, paint, detergent	In ½ tub water
16	Sylvia and Sam Snack	Take away food shop	Water & red food colouring, soy sauce	5 drops/full Tub water
17	Maureen Shop-a-lot	Shopper	Veg oil, plastic bag, cigarette butt	½ Tub
18	Victor Greengrass	Mower	Grass clippings	½ Tub
19	Gerry Greenleaves	Gardener	Baking soda (pesticide), weeds	½ tsp, ½ Tub weeds
20	Ernest & Eileen Everyone	Community	Mixture of everything	band aids, sand, chemicals, baking soda, coloured streamers, paper

## A CATCHMENT STORY

Teacher to read the following script.

### Introduction

This little story talks about how everyone, including all of us, in the Upper Parramatta River catchment, affect the river's health.

I have given many of you a small container with a name on it. When I mention that name in the story I want you to come up and empty what is in the container into the river catchment (the aquarium).

Before I start the story about our river and its catchment, let us have a think about what a catchment is.

*(Ask for suggestions and then demonstrate by getting everyone to cup hands and pretend that they are standing in the rain. What would happen? This is a small example of a catchment and the Earth's surface is divided into lots of bowls just like that, with a river in the bottom of each bowl.)*

A catchment includes a river and all of the creeks, streams and other smaller rivers which run into it. Importantly, the catchment also includes the land around these waterways. Water runs off this land surface to enter the rivers and creeks.

*Can anyone tell me some ways in which we are linked to the river from our houses and schools?*

**Stormwater Drains.** *Who can tell me where water that goes into stormwater drains goes?*

This means that whatever we drop into the stormwater drain, whether it be litter, paint or detergent, it goes straight to our local waterway.

**Streets.** If we leave litter or oil from the family car on the road or in gutters it can be washed into the stormwater drain and then into the river.

**Sewerage systems.** All the internal plumbing in your house is connected to the sewerage system. This means that everything which goes down the toilet, sink, bath and laundry drains goes to a sewerage system, where most of it can be treated. However, some things such as fat, detergents, chemicals, are difficult to remove from the water before it is sent into our waterways and ocean. This is bad news for our fish and water plants. Also during wet weather it is possible for stormwater to enter the sewerage system causing it to overflow and allow raw sewage to run into waterways.

So these are just three ways in which our houses and schools are linked to the river. Think about farms, parks and boats on the river.

## The Catchment Story

Our river begins in the higher parts of the catchment – Prospect, Pennant Hills, Carlingford and Castle Hill and flows down and around some small rural holdings, some bushland and into the large urbanised and industrial areas of Blacktown, Toongabbie and Parramatta.

Everybody in the catchment has an effect on the river.

Let us take a ride with one drop of clean water from the very top of the hills all the way downstream until it reaches the Charles Street Weir. The weir marks the end of the Upper Parramatta River catchment – beyond the weir the Parramatta River continues on to Sydney Harbour and the sea.

Our drop of water travels down the hill past a quarry where **1. Dusty Boots** excavates road base. His trucks are diesel powered and leak oil into the creek, the wind blows rock dust into the water as well. The quarry pumps water out of the river to clean its equipment and flush out some of the waste. This waste includes acids, oils and crushed rock which all drain back into the river.

As the water goes down the slopes it gathers speed and enters farming country.

When the water passes **2. Clive Colt's Equestrian Centre**, some manure and mud washes into the water. Passing **3. Phyllis Featherstone's** poultry farm some of the hens' faeces and food pellets are washed into a drainage pipe and then into the river. By **4. Freda Fancy-Farm's** place some fertiliser and insecticide washes into the river as she waters her vegetables after dusting them.

The water is now in the outer suburbs of a large city, as it passes **5. Percy Pipe's Plumbing**, where there is an illegal connection to the stormwater drains, toilet overflow (sewage) and cooking oils are washed into the river. **6. Wanda Whatnot** has a very successful plant nursery and coffee shop here. As her premises are on a septic system which overflows now and then, a load of toilet paper and contaminated water runs into the river. In this part of the catchment a new housing estate is being built and acres of land has been cleared of all vegetation. Salt and soil enter the river because trees have been removed and they no longer trap the soil before it goes into the river. Because the trees have been removed, the water table has risen beneath the soil and brought up salt. This then makes it difficult to grow any new plants. Salt in the water can also harm the freshwater animals living in the river. **7. John and Joy Citizen** are very proud of their newly cleared block of land but are not aware of the fact that soil and salt are being washed into the creek. They are seen washing paint brushes in the gutter outside their house.

The water is now beginning to feel a bit queasy and wonders what is in store just around the corner where the Industrial Estate begins. **8. Mike Moneybags** who owns poorly maintained premises has just been fined for allowing heavy metal contaminated water to pour into the stormwater drain outside his factory. Mike sometimes hoses out the factory allowing the water and detergent to wash into a gutter which flows to the river. In the detergent there are phosphates which can cause an algal bloom in the river. Some algae is poisonous to humans and other animals. When the algae dies and begins to rot it uses up oxygen which animals in the water rely on and they may suffocate as a result.

**9. Carmel Scrub** is very busy with his Mobile Car Wash, after the first few washes of the day he empties his tanks into the street – detergent, waxes, oil, grease and dirt pour into the stormwater drain and enter the creek.

Slowly the river starts to wind its way through the suburban centre, many smaller tributaries have joined with it adding their pollution load to the water. One of these tributaries flows past a golf course where **10. Perry Putt**, the Greenkeeper is busy spreading fertiliser and spraying herbicides. He then hoses the greens and washes a lot of these chemicals into the local waterway.

*Look how our once clean water now looks and smells.*

But the journey isn't over yet. Coming up around the bend there are people using the river and nearby parkland for recreation. **11. The Guzzle family** are having a bar-be-cue by the side of the river. They are having a lovely time, then suddenly, a big gust of wind comes along and blows their litter into the water. There are plastic bags which fish could swim into, plastic rings from the milk containers which can get stuck around birds' necks, and bottles which fish and other small creatures like frogs may swim into and may not be able to get out of.

*Not only is this harmful to the animals, but what do you think about the appearance of the water?*

**12. Freddy Fishfinger**, their friend is fishing from the bank, unfortunately his line gets caught around a rock and is left in the water, where it may get wrapped around a fish or platypus. Further along the river, **13. Mrs Thepoint** and her children are feeding the ducks. Large aggressive, feral white ducks are fighting over the food scraps, and chasing away the smaller native ducks. Food scraps, white feathers and duck droppings are falling into the river. Also in the area lives **14. Danielle Doggears**. Danielle, like a good dog owner should, takes her dog for a walk every second day. The dog however often does his business during the walk. This waste is washed into the stormwater drain when it rains and then into the river. This is untreated sewage. Along the edge of the river there is an outbreak of the weed *Salvinia*. This has been caused by the build up of nutrients in the river.

*By now the river is looking and smelling quite bad and it still has not finished its trip through the catchment.*

The river is now in a heavily urbanised area and flows past a large school. Students attending the **15. Catchment Co-ed School** leave litter in the playground, this is blown into the creek. Detergent from graffiti removal, paint from washing paintbrushes and sand from the bare patches of playground also find their way into the water. Exhaust fumes from cars, which the students and teachers drive, add to the acid rain which falls. Another tributary joins the river here. It brings in some cooking oil, detergents and tomato sauce washed out of **16. Sylvia and Sam's Snack Bar**. **17. Maureen Shopalot**, who is always in a hurry, throws her cigarette butt in the gutter, leaves some plastic bags which blow out of the shopping trolley and drives off in her poorly maintained car which is dripping oil and radiator fluid onto the road. Sometimes she has to brake suddenly and leaves pieces of rubber from the tyres on the road. All this is washed off the road and into the stormwater drain the next time it rains.

The river now flows past some substantial homes where **18. Victor Greengrass** is mowing his lawn and very neatly piling the grass clippings along the river bank. He is talking to his neighbour, **19. Gerry Greenleaves** who has been weeding and spraying his roses with pesticide. He also piles the weeds neatly by the river bank and then hoses the garden and washes the lot into the water.

*Our poor water is really staring to look very sick now!!*

*But it hasn't reached the mouth of the river yet, it is still in our catchment.*

Before our drop passes the weir which marks the end of the Upper Parramatta River catchment, the water flows past **20. Eileen and Ernest Everyone**, who are in the street cleaning out the family car. Band-aids, streamers from the weekend football match, cigarette butts, sand from their trip to the beach, cans from last weekends picnic and old newspapers are thrown into the kerbside bin which is then knocked over by the family dog. The next time it rains all of this rubbish will be washed into the ever suffering river.

Now leaving the catchment and still having 25 kilometres to travel before reaching Port Jackson and the sea, our once clean water is full of oils, chemicals, litter and sewage and it looks extremely unhealthy.

*What do you think of the water now? (Take a glass full and pretend to drink. Compare it to the original water in the glass.)*

Look at what we have done to the water in our river. Look at how dirty it looks and it doesn't smell too good either. Can you imagine what it would be like to swim in that water? Could you imagine being a fish and living in that water or a plant trying to grow.

This is what happens to the water everyday in our river.

*However people are beginning to realise what a problem this is and have begun to understand that the Parramatta River, and other urban rivers are not drains. Councils, local community groups, governments and catchment trusts are cleaning up local waterways and returning them to their rightful place as important habitats, recreational areas and scenic attractions.*

### **End of script**

### **Conclusion**

Have the class brainstorm and draw a mind map of ways by which we might be able to reduce our impact on our river?

There are so many things we can do to reduce the pollution in the river.

I'd like everybody to choose one thing they can do this week to reduce the pollution in the river. Next week you can all share what you did for the river. You could then think of other things you and your family can do over the next month to reduce pollution in the river.

For example. This week my goal will be to use non toxic chemicals, (vinegar and bi carb soda) to clean the bathroom. Would anyone else like to share their goal for the week?

### **Acknowledgements.**

*Adapted from "Catchment Story", Colin Mundy, Hunter Catchment Management Trust*