WATERWATCH

The adventure of Puddles the platypus (Years F–2)

Introduction

This activity[2] explores the impact that stormwater pollution and people's actions have on platypus and other animals that live in our creeks and rivers. Students consider the different pollutants that can be added into a river along its journey and the cumulative impact they have on the health of the river and the animals within it. They will also discuss how everyone can take action to help animals like the platypus by reducing the impacts of stormwater pollution.

While this activity targets students from Foundation to Year 2, it can be adapted for (or by) students to Year 12. It can be used in Science, Geography and English as a writing stimulus and is also useful for community presentations.

Victorian Curriculum F–10[1] links:

Foundation – Level 2

Science

Science Understanding

Science as a human endeavour

People use science in their daily lives (VCSSU041)

Biological sciences

Living things have a variety of external features and live in different places where their basic needs, including food, water and shelter, are met (VCSSU042)

Living things grow, change and have offspring similar to themselves (VCSSU043)

Earth and space sciences

Earth's resources are used in a variety of ways (VCSSU047)

Geography

Geographical Knowledge

Places and our connections to them

Natural, managed and constructed features of places, their location and how they change (VCGGK068)

Reasons why some places are special and some places are important to people and how they can be looked after (VCGGK069)

Equipment

1. Plastic mat
2. Bowl (half full of water)
3. Plastic platypus toy or laminated picture of a platypus
4. Wooden spoons
5. Towel (for wiping hands)
6. Laminated copy of The adventure of Puddles the platypus (Resource 1)
7. Laminated images (such as a pristine natural stream, farmland, boating on a river, housing estate, drain, a stormwater outlet pipe, water rushing down the curb, rubbish in waterways, leaves and debris entering a drain, factories near a waterway, platypus entangled in fishing line or a hair tie)
8. Net to remove waste at the end of the activity

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1 Victorian Curriculum and Assessment Authority (VCAA) <victoriancurriculum.vcaa.vic.edu.au/> 4 March 2019.

2 This activity is adapted from *Who Polluted the Potomac?* Alice Ferguson Foundation, USA.

9. 16 small labelled containers (with secure lids) with the following contents:
   - **Cameron Caught-a-few**: knotted fishing line
   - **Barbie Que**: plastic bag
   - **Busy Basil**: yellow food dye plus water (wee)
   - **Dusty Daria**: dirt
   - **Gabe Grow**: rock salt (fertiliser)
   - **Carlos the constructor**: dirt
   - **Dalmar the demolisher**: a few drops of green food colouring in water (chemicals)
   - **George Guzzler**: hard plastic such as buttons (or a separate plastic water bottle labelled)
   - **Warren Wood**: mud plus water (sewage)
   - **Perry Paver**: sand/gravel
   - **Ed Tread**: cooking oil plus dark food colouring (oil/petrol) in water
   - **Samira Suds**: some drops of detergent in water
   - **Galina Gardener**: grass clippings
   - **Sachi Scruff**: mud plus water (dog poo)
   - **Smoky Sarita**: cigarette butts/cigarette filters
   - **School kids**: hair ties

Preparation

Prepare the 16 containers as per instructions above. If there are more than 16 students in the class, you can make multiples of the same container.

Set out the plastic mat with the bowl of water and spoon in the middle of the mat. Place the towel next to the bowl of water.
Identify the catchment in which the students live. A catchment is the area over which rainwater flows and collects in a river. It includes all the creeks, streams and other smaller rivers which run into it.

You can adapt the story (Resource 1) to suit your class and make it a more interactive experience. *Stormwater story* <https://www.melbournewater.com.au/media/8426/download> is a similar activity that can be developed for other year levels.

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Activity steps

1. Begin by setting the scene. Ask questions to gather student ideas about:
   - Where do platypus live (rivers and streams, in the water)?
   - Have they ever seen a platypus in the wild? At the zoo or wildlife park?
   - Where does their local waterway come from and where does it go (its catchment)?
   - How does water flow into the waterway?
   - What are the features and land uses of the river catchment?
   - What impact may these features and land uses have on the quality of the water in the waterway?
2. Explain that the bowl of water represents our river.
3. Assign each of the 16 students a character and a corresponding container as outlined above. (If you have more students, you can double up the containers and their contents.)
4. Place the plastic platypus toy or the laminated picture of the platypus in the bowl of water and explain that platypus live in our rivers and streams.
5. Read *The adventure of Puddles the platypus* (Resource 1) and when each student hears the name of their character mentioned in the story, they empty the contents of their container into the bowl of water. If there is an impact on Puddles (for example, fishing line is caught around his tail), students can also act that out on the plastic platypus toy or the laminated picture.
6. Debrief by discussing the story, highlighting the key messages and concepts.

Extension activity

Students could research their catchment and the animals that live in it and create a story about their own waterway for their peers or for younger children using local images and information. Local infrastructure and land uses could be included.

Teacher background

Potential impacts of stormwater runoff are:

- Platypus live in our rivers and streams and are very sensitive to pollution. Their habitat is affected by development, pollution, rubbish, farming and human impacts such as littering.
- Many waterbugs living in rivers and streams may die or their population may decrease. Many are sensitive to oxygen, pH, nutrient levels, turbidity etc. Oil on the surface of the water can prevent some waterbugs from breathing and chemicals such as pesticides can kill them.
- Fish, frogs, platypus and other animals feeding on waterbugs may not be able to find enough food and they may die or their population may decrease too.
- Trees and vegetation protect the banks of waterways. If livestock are allowed to drink from waterways, the vegetation is damaged and the banks erode. Off-stream watering points for livestock can prevent this.

- Surrounding areas can be flooded if drains or waterways get blocked.
- After periods of heavy rain, sewage pipes filled with extra rainwater can overflow into local creeks that are already flooded with contaminated stormwater. People should avoid swimming in rivers or at the beach immediately after flooding rains for at least 48 hours. See the sewer spills video: <https://www.melbournewater.com.au/media/2391>
- Riverbanks and beaches look less attractive covered in litter and spoil the experience of visiting them.
- Pollutants may enter the food chain – including the food that people eat.
- Marine animals may accidentally choke on litter (e.g. a plastic bag may look like a jellyfish) or get litter (such as hair ties) stuck around their neck, limbs and bills. Snipping circular litter (plastic bottle rings, six pack drink can holders, rubber bands and hair ties) can reduce the incidence of this.
- Increased nutrient levels in a waterway (eutrophication) can cause algal blooms (overgrowth of plants and algae that blocks light and removes oxygen from water).

With older students, you can mention that studies have shown that when cigarette butts enter waterways chemicals such as nicotine, can be released into water and have been found to be harmful to aquatic life even in small quantities.

Key messages

- Stormwater typically reaches waterways through stormwater drainage systems.
- Clean stormwater improves the amenity of local waterway areas that we like to visit.
- Litter and pollution from stormwater runoff affects waterway and bay health. Everyone can help reduce the impact of litter by putting rubbish in bins, snipping circular litter and picking up after dogs.

Useful resources

River health and monitoring
<www.melbournewater.com.au/water/health-and-monitoring/river-health-and-monitoring>
Melbourne Water monitors rivers and creeks so they know if their condition changes or if the improvement programs need adjusting. Learn how Melbourne Water assesses river health and views current data.
Other information includes: indicators of river health, the health of Melbourne's waterways, and key waterway values.

PlatypusSPOT
<www.platypusspot.org/>
PlatypusSpot is a citizen science program that asks people to submit their platypus sightings. Using the PlatypusSpot app, the general public can contribute to the ongoing conservation and research of the platypus. The website also offers information about platypus biology, conservation and threats to its survival.

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Know your river booklets
Know your river - Werribee River
Know your river - Yarra River
Know your river - Maribyrnong River
Know your river - Dandenong Creek
Know your river - Bass River
The booklets provide valuable teacher background information about the history, geography and wildlife of the Werribee River, Yarra River, Maribyrnong River, Dandenong Creek and Bass River.

River Detectives – Story of a River
<www.riverdetectives.net.au/wp-content/uploads/2017/03/RD-Manual-Story-of-a-River-Teachers-Section-APPROVED.pdf>
This activity is a longer version of Story of a River and contains positive and negative actions in the one story.

Drainage story of the wetland video [2:43]
<www.youtube.com/watch?v=U0J3OrL8Nqc&feature=youtu.be>
This video describes the history of the Edithvale and Seaford wetlands and explains what we can do to maintain the health of the wetlands.

Stormwater management
<www.melbournewater.com.au/planning-and-building/stormwater-management>
Managing stormwater helps prevent flooding, improve water quality and protects our waterways. This page give practical advice on using water sensitive urban design in developments.

Raingardens
<www.melbournewater.com.au/community-and-education/help-protect-environment/raingardens>
Raingardens are self-watering, low-maintenance gardens designed to protect our rivers and creeks, by capturing stormwater that runs off hard surfaces when it rains. This page contains resources to build a raingarden and provides examples of raingardens across Melbourne.

Stormwater fact sheet
<www.riverdetectives.net.au/wp-content/uploads/2017/03/RD-Manual-Stormwater-Teachers-Section-APPROVED.pdf>
Teacher notes and general information about stormwater.

Old Bernie's pond
An interactive game that asks students to take action to clean up a pond. Requires Adobe Flash Player.
<http://www.scootle.edu.au/ec/viewing/L27/index.html>

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Resource 1: The adventure of Puddles the platypus

High up in the mountains, a little stream runs through the forest. The water is clear, icy, fresh and clean. The forest is part of a national park where many animals, like Puddles the platypus, live. Puddles loves to snack on macroinvertebrates, tiny waterbugs that hide under rocks in the stream.

One day, while Puddles is searching for macroinvertebrates, he sees a large, strange red object floating in the water. He wonders if it is a rock. At first Puddles is afraid of the floating rock and hides amongst the water plants while he watches as it hovers at the edge of the bank. The red rock then drifts out towards the middle of the stream and is carried off by the current. Puddles decides to follow but he is cautious and doesn't get too close.

Puddles notices some people relaxing under the shade of the gum trees on the edge of the stream. **Cameron Caught-a-few** has caught three fish! But when he packs up his tackle box, he forgets to pick up a bundle of fishing line sitting on a rock next to the water's edge. It falls into the stream.

As Puddles swishes his tail to swim past, the fishing line gets caught on his foot. Luckily, he flicks it off and keeps swimming.

A little further along the stream, Puddles sees the Que family who are enjoying a picnic on the banks. National parks don't have bins (you take your rubbish home with you instead) and one of the girls in the family, **Barbie Que**, left her rubbish on the picnic table. The wind blows it into the stream.

'Argh,' cries Puddles, as a plastic bag covers his head. Luckily, he shakes it off as the red rock disappears around a bend.

As Puddles follows, he hears loud noises and splashing. A group of children are swimming in the stream. **Busy Basil** is busting to go to the toilet and wees in the stream. As Puddles avoids the children, he sees a crayfish looking for food between the pebbles. Platypus sometimes eat crayfish so this one swims away and hides in a nearby water plant.

Just beyond the national park, the little stream passes through **Dusty Daria's** farm. Cows have trampled all the grasses and shrubs along the water's edge and the soil is being washed into the stream.

'This is not a good place for platypus to burrow,' thinks Puddles and continues downstream. 'How do other animals see in this cloudy water?' he wonders. Another farmer added some fertiliser to make his vegetable crops grow bigger and stronger. **Gabe Grow's** fertiliser soaks through the soil and into the little stream. The fertiliser has made a lot more plants grow from all the extra nutrients in the water. Too many plants makes it hard for Puddles, and other animals like dragonfly larvae, to find food.

The little stream now joins up with other streams from other mountains and turns into a larger creek. New houses line the creek in the outer suburbs where families want to live. **Carlos the constructor** is very busy building new homes. Lots of trees have been cut down and the land has been cleared to make more room. When it rains, the water washes dirt from the building sites into the creek.

As Puddles keeps swimming, he notices he's travelling through an industrial area with lots of factories. He sees a man moving some old barrels that smell like chemicals. It is **Dalmar the**

demolisher cleaning up. Dalmar wants to finish work and get home quickly so he dumps the liquid waste into the creek. As Puddles passes, he feels his skin tingling and he sneezes. He swims past some fish called galaxias who are feeling the same.

Puddles notices more and more people doing activities on and around the river. A loud boat full of people goes past right above his head. Puddles tries to stay away from the boat but as he surfaces for air, PLONK!

'Ouch,' cries Puddles as something hard hits him on the head.

George Guzzler and his friends have thrown their bottles and rubbish over the side of the boat and into the creek.

Puddles soon realises he has travelled a long way from his home. Instead of trees and animals, he now sees houses and roads everywhere.

Many years ago, the houses here were in the country and have septic tanks for the wastewater from their toilets, showers, sinks and baths. **Warren Wood** knows his tank is full and has phoned the company to come and empty it next week. The wastewater is starting to leak through the soil and runs into the creek.

As Puddles swims through the creek below Warren's property, he meets a rainbow trout searching for insect larvae and flies on the water's surface. Puddles is not enjoying his trip and considers turning back when he sees the floating red rock out of the corner of this eye.

A big thunderstorm is now passing over the suburbs and the creek. Puddles doesn't mind and keeps swimming. He sees people working outside duck for cover. One man has a big pile of sand in his driveway, which he is using to place his pavers. **Perry Paver's** sand starts to wash away in the rain!

The creek now flows under a road bridge. Cars cross the bridge in the rain and water runs off the road. The water running into the stormwater drain is rainbow coloured from cars that are leaking oil. **Ed Tread** does not look after his car very well and oil drips onto the road. The creek is not only cloudy from sand but has an oily layer on top too. Puddles likes the water back home much better.

When there is a break in the rain, **Samira Suds** quickly washes her car in the driveway. The soap and water run down the driveway and into the street where is disappears down the stormwater drain.

'Yuck,' thinks Puddles, as he tastes the water. He can't see the red floating rock so pushes his way through some reeds and finds some slow moving water that isn't as cloudy and tastes much better. He turns his head to see a growling grass frog almost eaten by a white faced heron. He has found a wetland. Although Puddles would like to stay, he remembers the red rock and continues on his way.

He feels something clinging to his fur and shakes it off. It is green and thick. Earlier in the morning **Galina Gardener** mowed her lawn and left a big pile of grass which has been washed down the drain and into the creek. The grass clippings are sticking to Puddles' fur.

The river now flows through the inner suburbs and it starts raining again.

'Ew, what's that smell?', wonders Puddles.

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Puddles passes a park where people walk their dogs. **Sachi Scruff** is a bit forgetful and leaves her dog's poo on the ground. The dog poo washes down into the river where there are ducks.

Outside the cafes and shops, people are drinking coffee and taking a break from work. **Smoky Sarita** finishes her cigarette and flicks the butt into the gutter. On a wet and rainy day like today, all the cigarette butts wash down the drain and into the river.

During lunchtime at the local school, the **school kids** drop their hair ties and rubbish on the ground. With all the rain, the hair ties and rubbish are washed down the drains, into the river and out to the ocean. Poor Puddles gets a hair tie caught on his bill as he is foraging for food. Luckily, he gets it off but he knows another platypus who wasn't so lucky.

Suddenly, the large red floating rock stops on the edge of the water at a sandy beach. Here the river is wide and fast and flows out into the bay. Puddles realises that the red rock isn't a rock at all but a canoe with a person inside!

'Ah,' sighed Puddles. He is pleased he has discovered what the red rock is but is upset at the pollution he found on his way down the river.

'I wish I could talk to that person and tell them that if I were a person I'd take much better care of the river,' he thinks. 'The animals in the river rely on it to survive.'

Puddles turns around and begins the long journey back upstream to his lovely home, high up in the mountains.