PROTECTING DANDENONG CREEK

LEVEL

Level 3 – Level 4

ACTIVITY DESCRIPTION

Students investigate what happens when people's activities affect the biodiversity of an area. They use information from their recent trip to Puffing Billy Railway to make links with retaining the healthy waterways of Dandenong Creek and preventing environmental hazards in the future. They understand that humans have an enormous effect on the health of the natural environment and that their choices make a difference.

THEME

- Protecting biodiversity
- Pollution
- Human Impacts

MATERIALS REQUIRED

This activity can be a whole group activity or small group activity. It does require a lot of set up and materials, but it is an activity the students will never forget.

There are 10 land users (characters) identified in this activity story.

- 10 small containers or jars

Labels for each of the jars

- Power station
- Gardens
- Roads
- Hobby farms
- Fishing
- Sawmills
- Coalmine
- Farming country
- Tourism
- Subdivision

- One large clear container with water (creek), to pour all the ingredients into. The larger the capacity the better the impact. If your students are in small groups, you will need one large container for each group.

LAND USE	SUBSTANCE	QUANTITY PER GROUP
Coalmine	Vinegar (acid rain)	1 Tablespoon or ½ canister
Sawmill	Small pieces of bark	2 Tablespoons or 1 canister
Gardens	Baking soda (pesticide)	1 Teaspoon
Industries	Ash from a fire or dust from the vacuum	2 Tablespoons or 1 canister
Roads	Oil from cars/trucks	1 Tablespoon of vegetable oil
Farms	Thick, muddy water	2 Tablespoons or 1 canister
Hobby farms	Yellow water/toilet paper	1 Canister water with yellow food dye and small pieces of toilet paper
Tourism	Paper, plastic	1 Canister of small pieces of paper and plastic
Fishing	Fishing link or sinkers	Small piece of fishing line or a sinker
Subdivision	Soil	1 Canister of soil

INSTRUCTIONS

Introduce the topic by discussing the biodiversity of The Dandenong Ranges. Ask students which animals and plants they remember on their recent trip to Puffing Billy Railway. Remind them of the beautiful Dandenong Creek and the lush Sherbrooke Forest they travelled through while on their train journey.

Discuss the types of businesses that make up the community and the features of the area, such as the creek, topography and climate that make The Dandenong Ranges such a unique and precious natural environment.

Discuss who looks after the natural environment? Can we help? What choices do we have?

Clarify the meanings of some of the key words they will hear throughout the task. These include pollution, catchment, pesticides, fertiliser, storm water, run-off. Once students understand the meaning of the key words that will be a part of this activity, begin the story.

Students work in small groups or table groups throughout the activity. Place a clear container of water centrally on each table, explaining that it represents Dandenong Creek.

Designate students to a labelled canister, keeping all the canisters at the front of the room. Students will get up and empty their designated canister into the water container during the story. When their 'character' appears then they can pour the contents of the canister into the 'creek'.

Read through the story "Protecting Dandenong Creek" to the students. While you read you will be demonstrating the causes and effects of human impacts and pollution on the creek system. As a group, students take turns to pour various "pollutants" into the container of water.

Discuss which types of water pollution do they think are the worst and will have the most impact? Why? Which ones will have the least impact? Why?

After the story is finished students will have a far greater understanding of the human impacts on our waterways. Explain there are laws that make sure that activities like coal mining, power stations, industry and piggeries have to control their pollution. It is much harder to control pollution from many farming activities, subdivisions and gardens.

There is still a lot of water pollution. A lot of it comes from the land and is washed into rivers after rain. Often the sources of water pollution are:

- Leaks from home sewerage tanks
- Dog droppings washed from the roads, footpaths and gardens
- Accidents by industry
- Illegal dumping of chemicals
- Farming activities, such as fertiliser used on the land and washed away
- Oil dripping from cars
- People causing litter
- People washing chemicals like paint and fertiliser down drains.

What can students do to help prevent polluting substances reaching creeks and rivers. How can we protect our biodiversity?

EXTENSION ACTIVITY:

Create a poster or campaign to protect Dandenong Creek – get students to create a slogan/poster to reduce the use of one of these pollutants or reduce the amount of one of these pollutants on the river.

SUGGESTIONS FOR ASSESSMENT

Participation in a practical Science task. Ability to work collaboratively in a group and follow instructions. Ability to communication ideas with others.

CURRICULUM LINKS

GEOGRAPHY

Identify and explain the interconnections within places and between places (VCGGC073)

SCIENCE

Science knowledge helps people to understand the effects of their actions (VCSSU056)

With guidance, identify questions in familiar contexts that can be investigated scientifically and predict what might happen based on prior knowledge (VCSIS065)

BACKGROUND INFORMATION

MAP OF DANDENONG CREEK

Reference: Melbourne Water

THE STORY OF DANDENONG CREEK

This is the story of a very special creek – our creek, The Dandenong Creek. Our creek takes its long journey from the foothills of The Dandenong Rangers in Melbourne's south east, where the rain runs off the mountains and travels a very long way, weaving through suburbs, valleys and farms on a 53km journey, into the Patterson River and onto Port Phillip Bay where it reaches the sea.

The majority of electricity transported to Melbourne is from the Coal mine generators in the Latrobe Valley in Gippsland. It burns large quantities of coal and releases pollutant gases into the atmosphere. These pollutants combine with moisture in the atmosphere to produce acid rain. Rainfall carries these acids back to the Earth's surface where it flows into the Dandenong Creek.

The creek gathers momentum as it starts traveling down the mountains. The creek continues its journey towards the sea through Sawmills where, recently, some trees were cutdown. Afterwards it rained on the Mills and the rain run-off from the paddock went straight into our creek bringing with it small pieces of bark.

The farm next door is a piggery. Some of the manure from the pigpens washes into a drainage pipe that then empties into our creek. On the other side of our river are grazing lands. There are very few trees left over there and in some of the lower parts of the pasture, the water table has risen because the trees are not using the water anymore. This water brings the salts in the soil up to the surface making the land salty and unusable. It also means that water that runs off the land and into our river is salty. This threatens plants and animals in the river. On top of that cattle feed on the plants on the banks of the river. When heavy rains arrive the banks collapse into our creek.

Slowly our creek starts to wind its way through the suburbs of Olinda, The Basin and Kilsyth. Some of the houses along the river are hobby farms that are not connected to a sewerage system but have their own septic tanks. Occasionally these tanks overflow and untreated sewage seeps directly into our river.

Just around the bend there are a number of people making use of the creek.

Someone in Bayswater is fishing on the banks. Unfortunately, their line and sinker get caught around a rock and is left in the water. A group of people are enjoying a picnic at a park overlooking the creek. A gust of wind blows some of their rubbish off the table and down into the water.

Further downstream our creek becomes a tourist attraction. A charter boat is giving some people a scenic tour of our river. Drinks are for sale on board but not everyone uses the bins that are provided.

Our creek now starts to wind through the suburban part of the town where a new subdivision is being developed. Many of the trees have been removed and when it rains, the top layer washes straight into our river. Most houses in the developed parts of the town have nice gardens. To keep all those nasty bugs away the gardeners, use pesticides. At the end of the day the sprinklers are turned on to water the plants and the pesticides wash off down the storm water drains and straight into our river.

People who have spent the day at work and school are now starting to drive home. The roads are very busy and oil drips out of many of these cars and sometimes they leave traces of rubber on the road when they have to brake suddenly. Every time it rains these pollutants are carried into the storm water drains and then into our river.

There are also some industries along our river here. They use detergents to keep their production equipment clean. But sometimes, the dirty water is hosed out of the factory into the gutter where it disappears into a storm water drain. Once again, this water flows straight into our creek. Sometimes there are phosphates in the detergent, causing excess algae growth in the creek. When this algae dies and begins to rot, it uses up oxygen in the water which animals in the river rely on. They may suffocate as a result.

With one final bend our creek finally arrives at Port Phillip Bay, its mouth and flows into the sea. But look at what flows out with it!

What can we do with our creek?

Reference: For the purpose of this activity Puffing Billy Railway staff have used, the "story of a river" which has been adapted from "Who pollutes the Potomac?", Alice Ferguson Foundation, USA.