

What has happened to our streams?

Essential

Learning outcome

- Students can evaluate the impacts of human activity over time on the state of a stream.

Method

1. Collect all of the materials and place them in film canisters with labels indicating their content. Fill enough canisters for each child or pair of children.
2. Set up a clear plastic container with water in it (it needs to be fairly large). This represents the stream.
3. Read the story 'A beautiful stream' (overleaf) as a class activity. When a form of pollution is mentioned, the child with the name of that pollutant on their canister walks up to the 'stream' and empties their canister into the water. Discuss the questions in the story.
4. After the story you could also discuss the following:
 - How did you feel at each stage of the story?
 - What are the advantages and disadvantages of some of the technologies that people have introduced?
 - How would you like the stream to look in the future?

Teachers' notes

Unlike the stagnant water in the plastic bowl, the real stream would carry this pollution into the next river, lake or sea. Most of the pollution in our streams, rivers, lakes and seas builds up as a result of many small incidents rather than from one big event. Most of the pollution in Wellington Harbour is not caused by spills from boats or ships, but from the accumulated pollution emptied by stormdrains rivers and streams into the harbour. This means we can all do something to help.

Materials

Clear plastic container filled with water

Enough film canisters for the class, each filled with one of the following:

leaves, twigs, rotting tree, rope nets, paper, rotting vegetables, gravel, soil, sheep's wool, 'sheep's poo' (mud), 'fertiliser' (green food colouring), 'herbicides' (yellow food colouring), 'poison' (red food colouring), rubble, toilet paper and waste, nylon nets, oil, paint, 'petrol' (soy sauce), detergent, old plastic bags, 'toxic chemicals' (tumeric powder)



A beautiful stream

Once there was a beautiful stream, situated not far from here. This was a particularly lovely stream. As a little stream, it flowed down from the hills to the sea, winding through a green and luscious forest and tumbling over rocks and pebbles. In the stream lived lots of tiny plants, little insects and even some fish named inanga (whitebait) and kokapu (native fish). Sometimes birds such as kotare (kingfishers) fed on the fish. The waters of the stream were cold and fresh; it was sparkly clear and very clean.



If it were a really lovely hot day, would you like to swim in this stream?

Would you like to sit down and enjoy a picnic beside it?

Would you eat fish that were caught in this stream?

Occasionally **leaves and bits of grass** from the trees fell into the stream. But this was good as it provided food for the insects that lived in the water. They ate the dead leaves and kept the stream clean. Sometimes old **twigs** or even bits of **rotting tree** would fall into the stream. But the insects (or macroinvertebrates) would eat these too. One day, a small group of people came to live near the stream. They were Maori people. They lived happily beside the stream. The birds and fish and macroinvertebrates were happy too. The Maori caught fish from the river using **rope nets**. If the rope nets broke and bits were left in the stream, the macroinvertebrates would also eat this, as the nets were made from flax and they like to eat flax. The people were very careful to look after the river as they saw it as being very special; indeed they thought of it as a taonga or treasure. If it were a really lovely hot day, would you like to swim in this stream?

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After many years settlers from Europe arrived in the area where the stream lay and they began to build a town nearby. The town was much bigger than the Maori village and soon a lot of rubbish had built up. Some of this rubbish, like **paper** and **rotting vegetables**, blew or fell into the stream.

As the town grew, the settlers needed more food so they started to clear a lot of the bush around the stream to make way for farms. As they cleared the bush, the **soil** or dirt was turned over and disturbed - quite a lot of it washed into the stream. There were no trees left to anchor the soil so more and more soil washed into the stream. They raised sheep and cows on the farms so sometimes **sheep's wool**, and **sheep's poo** would get into the stream. The farmers also put **fertilisers** on their soil so that more food would grow for all the new people in the town. And sometimes they sprayed **herbicides** from an aeroplane to kill off the gorse that was growing all over the hills.

Investigate

Essential

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As the town grew, bigger and better houses and smart shops were built. Each time something was built more **rubble** fell into the stream. Sewer pipes were constructed to remove waste from the bathrooms and toilets of these new houses. But sometimes there were spills from the sewers and **toilet paper and waste** would end up in the stream, flowing out to the sea. Fishermen started using **nylon nets** as these were stronger than rope – they caught many fish and soon there were very few left. But sometimes these nets became tangled in the stream and would break off and stay there. As the town grew, many factories were built and made wonderful new things like cars. The factories were important to the people for jobs and goods, but sometimes they had accidents and things like **oil and paint** were spilt and eventually washed down into the stream. The macroinvertebrates could no longer live in the stream – they couldn't eat the oil and paint.

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Still the town continued to grow. By now, many people were using cars to drive around from one place to another. Cars were useful but sometimes they leaked **petrol** onto the road. The petrol would wash down the stormdrains and into the stream. The people also washed their cars using **detergents**. These detergents also washed down the stormdrains and into the stream. As more things were made in the factories, more litter was created and soon there were **bits of old plastic bags** drifting into the stream. And then one day a truck **carrying toxic chemicals** crashed on the road near the stream and lots of horrible yellow stuff poured onto the ground...into the stormdrains and down into the stream.



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