



“Who dirtied the water!?”

Task: For students to investigate how the water quality in our rivers, harbours and oceans has deteriorated through human impacts.

This interactive story asks students to take on the roles of different historical and modern characters who have had a role in the pollution of their local waterways. As the story is read, each character in turn adds a film canister full of pollutants to a jar of clean water representing the ocean or harbour.

Key Concepts:

- Students should develop a greater concern for local waters and an understanding that we are all partially responsible for water pollution. Solutions will require many groups working together.

Materials:

To set up the session:

- Clear glass or plastic wide-mouth jar.
- 17 Film Canisters
- Permanent marker pen
- Stir stick (wooden spoon or stick)
- Substances to fill canisters up with (listed under 'setup')
- Sieve
- Rubbish Bag

Label / Fill each canister with:

1. RIVERS AND STREAMS - *Sand*
2. MANGROVES - *Dry grass*
3. SHELLFISH - *Crushed seashells*
4. MAORI - *Crushed seashells*
5. SETTLERS - *Compost scraps*
6. FARMERS - *Soil*
7. HOUSES - *Toilet paper*
8. SEWER PIPES AND SEPTIC TANKS - *Soil/ water / raisins*
9. RUNOFF - *Soil*
10. FISHERMEN - *Nylon line*
11. BOATERS - *Plastic pieces / toilet paper*
12. CAMP GROUNDS - *Dish detergent*
13. CLEANING - *Baking soda*
14. SUN BATHERS - *Paper / plastic*
15. FACTORIES - *Vinegar/ shaving foam*
16. ROADS - *Cooking oil / water*
17. PEOPLE WASHING CARS - *Dish detergent /water*

The story

“Once upon a time there was a beautiful piece of land. There were clear running rivers that flowed out into a large harbour filled with clear ocean water and dotted with green islands”.

(Point to the jar).

“Fish lived in the water, and the land was covered with trees. Both the land and its waterways had many different types of wildlife living there ”.

Discussion:

“Would you want to swim in this harbour?”

“Would you eat fish caught in this harbour?”

“Would you like to go boating in this harbour?”

1. **“RIVERS AND STREAMS** ran from the land, carrying sediment and sand with them as they flowed to the ocean”.

2. **“MANGROVES** grew along the edges of the harbour and estuaries. Parts of the mangroves washed into the ocean and became food for the fish”.

3. **“SHELLFISH** grew in the shallow water, including cockles, mussels, pipis, oysters and scallops”.

4. “A small group of people lived on the land near the ocean. They called the land (Insert your districts name here) The people called themselves **MAORI**. The Maori fished for food and shellfish in the harbour, estuaries and ocean. They also dumped some of their garbage nearby. In fact, we still find the piles of shells they left called 'middens'.”

Discussion:

“Would you want to swim in this harbour?”

“Would you eat fish caught in this harbour?”

“Would you like to go boating in this harbour?”

5. “After many years, **SETTLERS** from Europe came to live on the land named (Insert your districts name here). The settlers built a town much larger than the Maori villages. Some of the town garbage was dumped into the harbour, estuaries and ocean”.

6. “As the town grew, the settlers cleared native bush to provide more land on which to build. **FARMERS** cut down trees to clear their fields and allowed their stock to graze among the rivers and mangroves in the harbour and estuaries. Without trees and mangroves, rain carried soil into the water”.

Discussion:

“Would you want to swim in this harbour?”

“Would you eat fish caught in this harbour?”

“Would you like to go boating in this harbour?”

7. “More and more **HOUSES** and shops were built, and the town of (Insert your districts name here)

grew”.

8. **“SEWER PIPES and SEPTIC TANKS** were constructed to remove waste from houses and bathrooms. Sometimes broken pipes and overfull septic tanks leaked sewerage into the waterways”.
9. **“Since the mangroves had been cleared and the land filled in, RUNOFF** water washed pollution from the streets directly into the waterways”.
10. **“FISHERMEN** found that nets made of plastic or nylon were stronger than those made of rope. Sometimes these plastic nets got lost in the water”.
11. **“Fishermen and other BOATERS** sometimes threw trash overboard and emptied their boat toilets into the water”.
12. The town of (Insert your districts name here) continued to grow. As tourists began to visit the coast, **CAMPGROUNDS** were developed. Campers used kitchens and laundries to wash their dishes and clothes. Sometimes, these detergents went straight into the waterways”.
13. **“People CLEANING** their houses poured poisonous cleansers and drain cleaners down their stormwater drains which flowed directly into the waterways”.
14. **“Even swimmers and SUN BATHERS** going to enjoy the beach sometimes left garbage on the beaches”.
15. **“Many tar sealed ROADS** were made and rain washed pollution including car oil, antifreeze and rubbish directly into the stormwater drains – which lead into streams, rivers, and eventually the ocean”.
16. **“FACTORIES** built along the waters edge often dumped their wastes into the water”.
17. **“PEOPLE WASHING CARS** let the soapy water run down their driveways and down the stormwater drains”.

Discussion:

- “Would you want to swim in this harbour?”**
- “Would you eat fish caught in this harbour?”**
- “Would you like to go boating in this harbour?”**
- “Who dirtied the water?”**
- “Who is responsible for cleaning it up?”**

Debrief:

- **Discuss how students felt at each stage of the game**
- **Do students know of any of their local bodies of water that have been polluted?**
- **Who is responsible for monitoring pollution and taking steps to control and reduce pollution? (Regional Council)**
- **What is being done in your region to monitor for and control pollution?**
- **Talk about the different types of pollutants added. Is all pollution equally dangerous?**
- **Discuss actions you can take to reduce your class's polluting impact on the water. e.g. Don't let toxic substances or rubbish go down the stormwater drain, water conservation, not littering etc.**
- **What other steps could we take in our area to stop pollution of our waterways?**