

The story of a river

Resource sheet 18

Labels for canisters

- Power station
- Grazing land
- Waterskiing
- Gardens
- Herd of cattle
- Coalmine
- Park
- Roads
- Farming country
- Hobby farms
- Tourism
- Industry
- Piggery
- Fishing
- Subdivision
- Tannery

Substances

<i>Land use</i>	<i>Substance</i>	<i>Quantity/description</i>
Power station	Vinegar (acid rain)	canister
Herd of cattle	Thick muddy water	canister
Farming country	Baking powder (fertiliser)	teaspoon
Piggery	Thick muddy water	canister
Grazing land	Salty water	teaspoon salt in full canister of water
Coalmine	Vinegar (acid run-off)	canister
Hobby farms	Yellow food colouring/water/toilet paper	full canister water + small pieces of paper
Fishing	Nylon fishing line	tangle of line
Waterskiing	Vegetable oil	teaspoon
Park	Litter	styrofoam, plastic, etc.
Tourism	Litter	Paper, plastic, etc.
Subdivision	Soil	teaspoon
Gardens	Baking soda (pesticide)	teaspoon
Roads	Vinegar (acid run-off)	canister
Industry	Soapy water (detergent)	1 drop detergent in full canister of water
Tannery	Red food colouring/water	5 drops solution in full canister of water

Instructions

- Tape one label (from previous page) to each film canister.
- Give one labelled film canister to each student.
- Fill with the substances listed in the table, in the quantities given. (NB: All substances are non-toxic.)
- Place a clear bowl (e.g. a punch bowl or small fish tank) containing 4–5 litres of water centrally in the room.
- Distribute the canisters among the group. Tell students not to open them until their 'land use' emerges in the story.
- On cue, they are to empty their canister into the bowl of water, which is the 'river'.
- Read the story in a dramatic way, stopping at the end of each section when a character/land use is mentioned. Remind participants to come forward and empty their canisters.

The story of a river

This is the story of the travels of a very special river — our river — through its catchment. It begins in the higher parts of the catchment where the rain runs off the slopes and begins its long journey to the sea. In the valley below there is a power station which generates electricity for the region. 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 and can pollute the very source of the river. The water gathers momentum as it descends the slopes. The river continues its journey towards the sea through farming country where recently some crops were fertilised. Afterwards, they were watered and the run-off into the river has brought with it some of the fertiliser.

The neighbouring farm is a piggery. Some of the manure from the pig pens washes into a drainage pipe, which then empties into the river. On the other side of the river are grazing lands. There are very few trees remaining and, in some of the lower parts of the pasture, the watertable has risen because the trees are not using the water any more. This water brings the salts in the soil up to the surface, making the land unusable. It also means that run-off from the land is salty and this threatens the freshwater organisms and animals in the river. A grazing herd of cattle feed on the vegetation on the banks. When heavy rains arrive the banks collapse into the river.

The coalmine, which supplies raw mineral for the power station, pumps water out of the river to clean its equipment and flush out some of the waste. This includes various acids, which all drain back into the river. Slowly the river starts to wind its way through the outskirts of a major town. Out here there are a number of hobby farms. The houses here are not connected to a sewerage system but have their own septic tanks. Occasionally these tanks overflow and untreated sewage seeps directly into the river.

There are number of people making use of the river around the bend. Someone is fishing on the banks. Unfortunately their line gets caught around a rock and is left in the water. Other people are waterskiing. Their boat needs a service and in the meantime its engine is leaking oil directly into the river. Other groups of people are enjoying a picnic at a park overlooking the river. A gust of wind blows some of their rubbish off the table and down into the water.

Further downstream the river is being utilised for tourism. A charter boat is giving some people a scenic tour of the river. Drinks are for sale on board, and not everyone uses the bins that are provided.

The river now starts to meander through the suburban part of the town. A new subdivision is being developed. Many of the trees have been removed and, when it rains, the top layer of soil is eroded and contributes to silting up the river. Most houses in the developed parts of the town have a garden. To keep those nasty bugs away the gardeners use a range of pesticides. At the end of the day the sprinklers are turned on to water the plants. The pesticides wash off into the stormwater drains and enter the river.

People who have spent the day at work are now starting to drive home. In large towns there are many cars. Oil drips out of many of these cars and sometimes they brake in a hurry, leaving traces of rubber on the roads. Every time it rains these pollutants are carried into the stormwater drains and straight into the river.

There is still some industry along the river here. It uses detergents to keep its production equipment clean. Sometimes the dirty water is hosed out of the factory into the gutter where it disappears into a stormwater drain. Once again, this water flows straight into the river. If there are phosphates in the detergent, it will cause excess algae to grow in the river. When the algae die and begin to rot, this uses up oxygen which animals in the water rely on. They may suffocate as a result.

Redevelopment is occurring on the opposite bank. Demolishers have discovered a few drums of something mysterious. They won't be able to sell these as scrap. Someone suggests emptying them into the river. Everyone agrees, and the waste from the old tannery is released into the river, to the detriment of all the organisms and animals living in it.

With one final bend, the river finally arrives at its mouth and flows into the sea (or a large inland lake). But look at what flows out with it!

What can we do with our river? A heavy rainstorm would help. The fresh supply of river water from rain can help flush out many pollutants. Indeed, rivers can be a major way of flushing and cleaning ecosystems. However, this only moves the problem to a coastal area (or inland lake) where other ecosystems will be affected. We must reduce the amount of pollution that is entering the river.

('The Story of a River' is adapted from '*Who Polluted the Potomac?*', Alice Ferguson Foundation, USA)