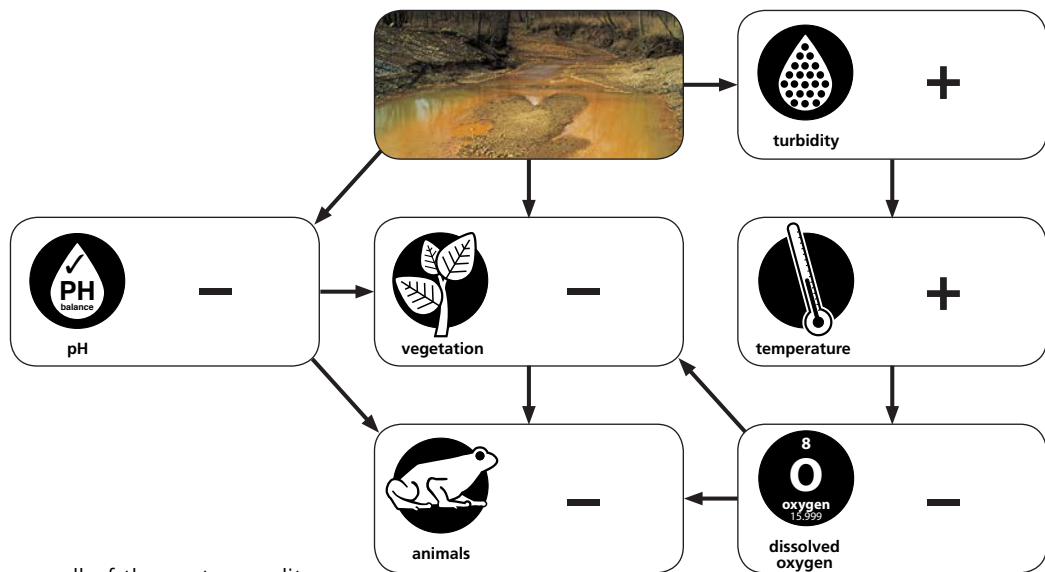




Think about impacts upon water quality of the three scenarios presented in this worksheet. How might physical, chemical and biological characteristics of water quality be affected? Represent impacts of each scenario with a mind map that displays interactions between water quality characteristics.

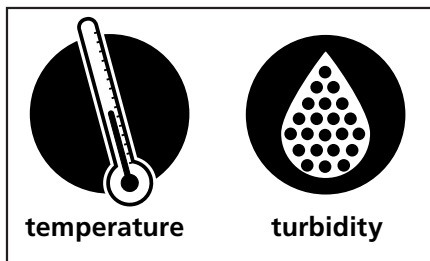
Use '+', '-' and '=' symbols to show which characteristics increase, decrease or stay the same. Use arrows to show how changes in one characteristic affect others.

Sample scenario: acid chemical spill contaminates lake

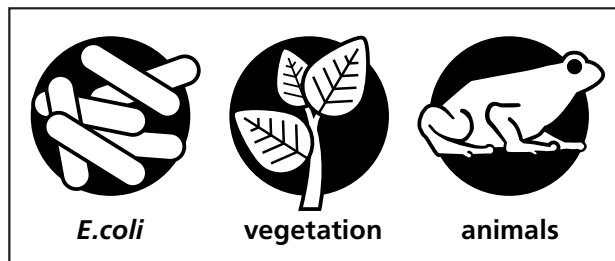


Include any or all of the water quality characteristics below in your mind map.

PHYSICAL CHARACTERISTICS



BIOLOGICAL CHARACTERISTICS



CHEMICAL CHARACTERISTICS



Scenario 1



Drought conditions in the Australian interior have forced large numbers of thirsty feral animals to congregate around shrinking waterholes.

Feral animals destroy waterholes

Feral donkeys, pigs, and horses in outback Western Australia have been destroying precious waterholes. Drought conditions in some parts of northern Australia have forced large herds of animals to aggregate around scarce water supplies in the region.

Agriculturalists, land managers and park rangers are dismayed by the damage these animals have caused local water bodies.

Farmer, Jerry Sturgeon, says, 'The horses and donkeys they

urinate and defecate in the water, and they're coming in such large numbers they destroy the banks and trample vegetation.'

Pigs are another problem, damaging waterhole surrounds as they dig for food, increasing erosion and sedimentation. Animals are also dying, becoming trapped in mud around dwindling water holes, leaving behind rotting carcasses that contaminate the water supply.

'Feral animals aren't just polluting what little water there

is left, they also compete with native animals, who also rely on these water sources for survival,' ranger Pete Barker said.

The large numbers of animals forced to get what water they can from limited sources seriously impacts on water quality.

'The water in these areas is becoming undrinkable, even for livestock. It's muddy, warm, and levels of nutrients and bacteria are excessive,' Jerry Sturgeon said. 'We're really worried. We're waiting for rain.'

Scenario 2

Campers leave litter behind

Local rangers have been dismayed by the poor behaviour of leisure seekers around local waterholes.

'They camp too close to the water edges, and they leave litter and toilet waste on the banks. These items often end up in the water,' ranger Kelly Bastian commented.

Some of the items rangers have discovered in water bodies include discarded fishing tackle, leaking fuel cans, used nappies, along with detergent and other chemical residues.

All of these litter items, and more, have a negative impact on water quality.

Kelly Bastian says, 'Litter can alter the water's pH, and human waste increases the levels of nutrients and bacteria in the water. We don't want to end up with a situation where we're forced to close waterholes due to a risk to people's health.'



They might enjoy the great outdoors but some visitors aren't doing the right thing around water bodies.

Rangers and concerned community members are meeting today to decide the best way forward. Local community spokesperson, Fran Boldy says, 'We all want to enjoy these recreational places, but the poor behaviour of a few could change that for many. Educating the people that do visit them is key.'

Sewage spill contaminates river



Residents have been warned to stay out of the local river after thousands of litres of raw sewage leaked into the water.

Warning signs have been erected along a 1-kilometre stretch of the Madder River after a local waste treatment plant discovered raw sewage was leaking directly into the water body. Residents are being urged to stay away.

Local Mayor, Sharon Dunstan said, 'People should not enter the river to swim, and they definitely must not drink water from within the vicinity of the leak.'

Water department staff is on site to monitor the impacts of the leak and to work with the local authority on waste management to discuss the best possible solution to the problem.

Raw sewage is currently no longer leaking into the Madder but due to sluggish currents and poor rains the sewage may take longer than usual to disperse.

Water department spokesman, Lionel Stern said, 'We're monitoring the situation very closely. Untreated sewage poses a real risk to people because of increases in bacteria.'

As well as being a risk to human health river pollution can lead to algal blooms due to an increase in nutrients. Only two years ago the Madder was site of a spectacular algal bloom that resulted in widespread fish deaths, and extensive damage to local vegetation.