Freshwater Pollution

What is it?

Freshwater ecosystems are things such as rivers, lakes or ponds. They do not include the sea, or oceans which have salt water in them. They contain lots of different types of animals and plants; from fish and ducks to tiny water beetles and worms, and from algae to water lillies.

When a river becomes polluted, it means that there are things in the water that should not be there (such as chemicals, objects or extra heat). For instance, if something is spilt into the river, either accidentally or on purpose, the river has been polluted, and the substance put into the river is called a pollutant.

How does it happen?

There are a number of different ways in which a river can become polluted, and there are many different things which can be pollutants. Some low levels of pollutants are not harmful to the area where plants and animals live together (the ecosystem), because the river is able to get rid of them itself, either by diluting them (making them weaker by adding water), or washing them away. When the river does this it is called natural repair, because the river is repairing the damage that the pollutants have done. Areas of water such as ponds or lakes, where the water does not move much, suffer more from pollution than rivers, as they are not able to get rid of the pollutants very well.

Rivers can also be polluted by chemicals released from factories or by chemicals and oils spilt on roads. These chemicals are pollutants, and this is called chemical pollution. Sometimes when there are too many pollutants in the water, the river or stream cannot get rid of all of them by natural repair. When this happens, the pollutants begin to affect the wildlife that is in the water, either by killing it or by making plants and animals grow differently.

Another type of pollution called organic pollution has a different effect on the wildlife in the river. The main causes of organic pollution are sewage works and farms. When organic pollution is released into the river, it is broken down (eaten) by millions of tiny bacteria and worms. Whilst breaking down this pollution, the bacteria and worms use up oxygen, much like we do when we breathe. When the amount of organic pollution is high, there is less oxygen in the water. This leaves animals, such as water beetles and fish, with not enough enough oxygen to survive and they begin to die.

Ways of detecting amounts of pollution

The government and other environment agencies are trying hard to keep the levels of pollutants down. To do this they need to find out where pollution levels are high. This can be done by finding out how much oxygen is needed by the bacteria, in order to break down the pollution in the lake or stream (this is called the Biological Oxygen Demand [BOD]).

Another way to find out about the levels of pollution in a river or a lake, is by looking at the species of animals there, particularly invertebrates.

Invertebrates are animals without backbones, such as worms, beetles, spiders and insects. Some invertebrates, such as flies, live the first part of their lives as larvae (which often look very different to the adults) in water, before emerging as adults with

wings. These creatures are very sensitive to changes in levels of pollution and can tolerate varying levels of pollution, from high (such as tubificid worms) to medium (such as freshwater shrimp) to low (such as mayfly and stonefly larvae). If the levels of pollution are not right for an animal, it will move away from that bit of water, provided it can move and there is more water for it to go to - it's easier to move in a river or large lake, than in a small puddle.

By taking water samples from different areas of the ecosystem (the place where the animals live), and seeing which invertebrates are there, not only can we see how polluted a river or stream is, but also where the pollution is highest or lowest along the river.

QUESTIONS

1) What is pollution?

2) What is a freshwater ecosystem?

3) What is natural repair?

4) What is chemical pollution?

5) what is organic pollution?

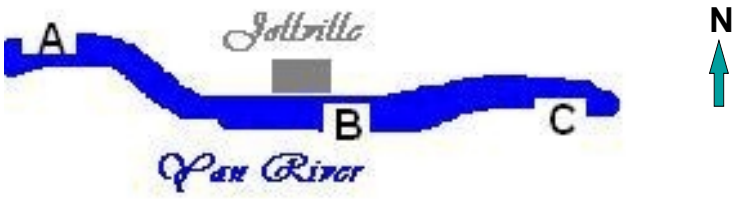
6) What is the biological oxygen demand?

7) What are invertebrates?

8) How can we use invertebrates to find out how polluted a river or stream is?

9)The following data represents the #'s of each organism at each of the 3 sites near Jollville.

	A	B	C
Tubificid worms	150	163	26
Freshwater Shrimp	80	75	90
Mayfly Larva	30	21	140



a) Which site is the least polluted? Explain.
b) Which site is most polluted? Explain.
c) What direction is the Yan River flowing? How do you know this?
d) Identify two things you could do to help solve the water pollution problems.