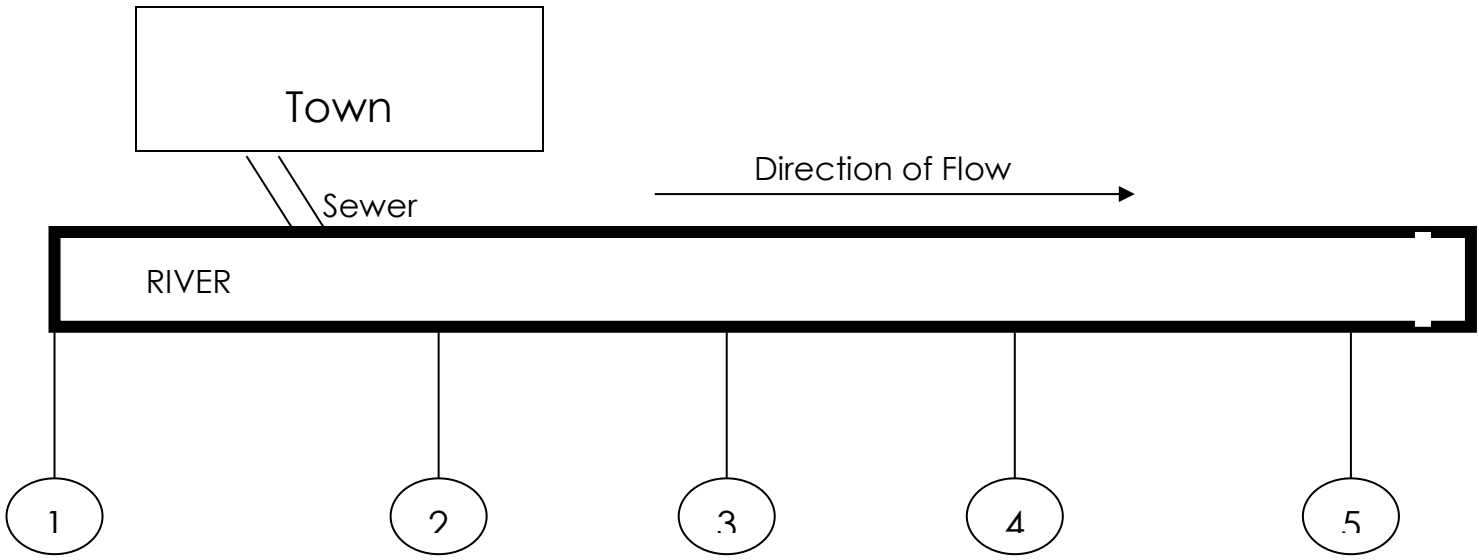
# Polluted River Survey

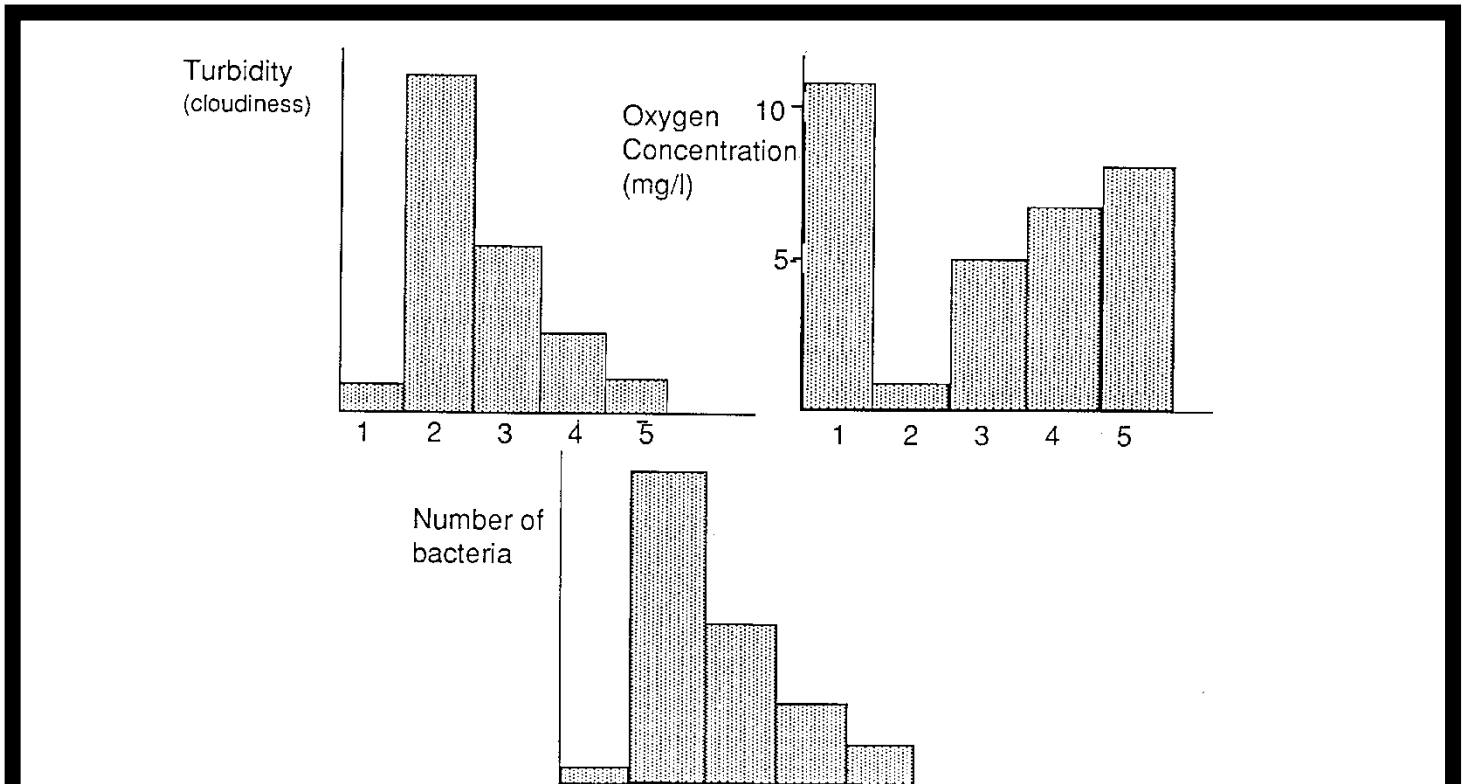
Changes in the degree of pollution can cause changes in a community of aquatic organisms in a river.

The activities of bacteria in water convert organic waste into harmless substances and in doing so use up all the available oxygen. As you go further downstream, oxygen will enter water from the air and eventually the community of aquatic organisms will return to normal.

Study the information below.




At five places along the river samples of water were taken and tested for turbidity (how cloudy the water is), oxygen concentration and numbers of bacteria. In addition, aquatic invertebrates were collected at each site. The results of this survey are shown below.



# Freshwater Invertebrate sampling

| Freshwater Invertebrate | Sample Site | | | | |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| Stonefly nymph | 15 | 0 | 0 | 0 | 12 |
| Mayfly nymph | 14 | 0 | 0 | 0 | 13 |
| Caddisfly larva | 3 | 0 | 0 | 1 | 1 |
| Blood worm | 0 | 0 | 30 | 15 | 0 |
| Sludge worm | 0 | 59 | 33 | 0 | 0 |
| Water louse | 1 | 0 | 0 | 20 | 2 |
| Shrimp | 2 | 0 | 0 | 1 | 1 |
| Rat tailed maggot | 0 | 24 | 4 | 0 | 0 |

**Questions:**

1. In which part of the river is the turbidity greatest?
2. What causes the water to be cloudy?
3. Why is there a large number of bacteria at sample site 2?
4. Why is there a low concentration of oxygen at sample site 2?
5. Why does the water get less cloudy as you go downstream of sample site 2?
6. Why do the numbers of bacteria decrease as you go downstream of sample site 2?
7. Give *two* reasons why the oxygen level increases as you go downstream of sample site 2?
8. Construct a bar chart to show the number of different kinds of species at each sample site.
9. What effect does the amount of sewage have on the number of different kinds of species at each sample site?
10. Construct a bar chart to show the total number of organisms at each sample site.
11. What effect does the amount of sewage have on the total number of organisms at each sample site?
12. For sample site 2 explain in detail the reason for each of the following:
    a. The increased level of pollution
    b. The increased number of bacteria
    c. The reduced level of oxygen
    d. The reduction in the number of species
    e. The increase in the number of organisms.