Activity 4.1 – Water Quality Testing

Introduction

In this activity, students will evaluate the water quality of their local waterway through a series of indicator tests and study the water bugs present. Once data is collected they will combine the information and look for patterns and relationships between land use, community attitudes and behaviours and water quality.

Estimated Lesson Time:
Water testing in the field: 2 to 3 hours
Interpreting and presenting data: 1 to 2 hours

- **If your school belongs to Waterwatch or Streamwatch** contact your school coordinator to get assistance with this activity.
- **If your school does not belong to Waterwatch or Streamwatch** you may wish to contact Oz GREEN to obtain a low cost water testing kit, or use the contact information on the first page to find out how your school can join these programs.

Outcomes

HSIE Stage 2 Outcomes

This activity meets the following syllabus outcomes: **Patterns of Place and Location ENS 2.5**
Section 4 could be appropriate at Stage 2 level if students are assisted by a trained team, such as a Streamwatch group from the local high school.

Science and Technology K-6

Stage 2
LT S2.3, INV S2.7, UT S2.9
Stage 3
LT S3.3, INV S3.7, UT S3.9

Keywords

- phosphates
- pH
- dissolved oxygen
- turbidity
- pollution
- disease
- contamination
- nitrate
- faecal coliform
- bacteria
- algae
- habitat
- toxic
- biodiversity

Process

Caution: Assume all waterways are polluted with sewage and toxic substances. Wear waterproof gloves, gum boots and take precautions to prevent the transmission of diseases such as hepatitis by carefully washing hands with soap and water after testing.

1. Select the sites that you wish to test.
2. Use the dip nets and identification charts to identify.
3. To conduct tests, work with your school Waterwatch or Streamwatch Coordinator. Obtain the Streamwatch Kit for Stage 2 or contact Oz GREEN to obtain a low cost water testing kit.
4. Follow the instructions set out in the kit.
5. Record data.
6. Identify pollution issues impacting on water quality and their potential source.

Table 4.1: Interpreting Water Quality Data

Water Quality Data	Interpretation	Possible Source
Dissolved oxygen levels below 5mg/L	Oxygen levels below level required to maintain ecological health of waterway	Organic matter, leaves Sewage
Phosphorous level above 0.05 mg/L	Nutrient levels above ANZECC guidelines for protection of ecological health of freshwater ecosystems – danger of algal bloom	Fertiliser Detergents Sewage
Turbidity levels above 10 NTU	Excess sediment is washing into waterway	Construction sites Erosion of soil from cleared land
Biochemical oxygen demand above 2mg/L	Excess organic matter in waterway	Excess leaves and other organic matter Sewage Excess growth of water plants and algae
Faecal coliform* levels above 600 colonies/100 mL	Water is unsafe for swimming.	Sewage Animal droppings Dairy and feedlot contamination
Water smells of oil and grease; oily 'rainbow' slick on the surface of the water	Water is being contaminated by oils and greases	Oil dripping from cars onto roads and driveways Oil and grease being tipped into stormwater drain Illegal dumping
Rubbish and litter	Rubbish on streets being washed into stormwater system	Uncovered rubbish bins Bad attitudes – people littering

* There are no single sample guidelines for faecal coliform specified by ANZECC. If a single sample is collected, the EPA Beachwatch program suggests a reading of 600 colonies should not be exceeded. If four samples are collected over a period of up to a month, then the level for safe swimming is if the average of the counts is less than 150 colonies/100 mL.