Lab Notes - for Teachers

http://abc.net.au/labnotes

Waterwatch

Water quality is accurately analysed and the results entered on a statewide database. The community obtains vital data and students have an opportunity to conduct important scientific research (see example report)

You will require:

- As many collection jars and labels as possible (encourage students to collect and bring these)
- Nets and scoops
- Local area maps
- Glassware (eg. pipettes, beakers, funnels).

To enter on the database - visit Waterwatch -

http://www.waterwatch.org.au/ - It is recommended that you read this site first as details may change

Desired Outcomes

Students:

- Gain awareness of the ecology of local ecosystems, particularly in relation to water degradation:
- Develop an understanding of the relevance of science to local environmental policy:
- Provide a valuable service to the community:
- Understand the importance of accuracy in scientific measurements

Time frame

Flexible - one or two semesters (ideally becomes ongoing)

Audience

Year 11 chemistry and/or biology students

Applications

The project could be adapted for environmental studies and geography or junior science electives. There is also scope for integration of some components into other subject areas eg. reporting as part of English. Interest may be sufficient to develop a voluntary Waterwatch group.

Getting Started

Water can be analysed for any or all of the following, depending on subject orientation, resources available, the expertise and interests of staff/students:

- Turbidity
- Salinity
- Dissolved Phosphates
- Dissolved Oxygen/Biological Oxygen
- Macro-invertebrates
- Conductivity
- pH
- Nitrates and other ions
- Demand Faecal Coliform
- Algal Content.

Samples could be collected by selected students who live near the sources chosen, or on regular organised excursions.

Planning (September/October):
Visit Waterwatch website and obtain relevant reading material, software or manuals. Decide on staff/classes to be involved and area to be studied. Assess existing equipment and decide on analyses to be performed. Contact relevant organisations (eg. Department CNR). Develop avenues for involvement of media and conservation groups, to facilitate communication and evaluation of the success of the program.

Preparation (November/December):
Order extra equipment and chemicals. Ensure intending students are made aware of costs eg.excursions.

Preparation (February):
Explain project requirements to students i.e.. sampling procedures, reporting, assessment. Appoint a group of students to co-ordinate activities and assign tasks eg. data entry, community liaison. Begin instruction in relevant theory.

Sampling (March/April):
Students conduct sampling according to procedures specified by Waterwatch, and enter information on database. Issue publicity releases of notable findings to local media and report to relevant organisations. Students submit drafts of work completed to date (eg. aims, procedure).

Analysis (April/May):
Collation and analysis of data, emphasising relationship between water quality and organisms present. Preparation of final reports to commence. Continue regular sampling for as long as possible and reporting to local groups and media. Investigate possible establishment of community and/or voluntary student Waterwatch groups.

Submission and Evaluation (June):
Students submit reports for assessment and appraisal by relevant organisations, eg. Department CNR, Landcare, Council. See sample excerpt of a student report. Evaluate and consider future viability of program in terms of quality of reports, membership of voluntary group, expressions of interest from the local community and media.

Contacts

Your first contact should be your regional Waterwatch Coordinator - contacts can be found on the Waterwatch website. Other contacts include local councils, local water authorities, Landcare and local farmers' groups.

Tips

Chemistry students make excellent tutors for chemical analytical techniques (this saves a lot of time).
Local councils and interested community groups may be willing to assist in funding equipment for analysis.

Example - Excerpt from a student report

WATERWATCH

VCE Biology Unit 1 Major Report

Summary:

In order to determine whether the water quality is acceptable for agricultural, recreational and domestic use, ten local sites were chosen and

sampled at fortnightly internals. Macro-invertebrate and algal content, and the amount of vegetation present at each site were assessed. The samples were analysed for conductivity, pH, turbidity, dissolved solids, oxygen, phosphorus nitrogen, and the results entered on the NEXUS statewide database. The results were compared with those from other areas.

It was found that the water quality in the lake was generally acceptable, although some sites showed unacceptably high levels of pollutants at times - these sites need to be monitored. Sites further upstream showed lower levels of pollutants, and there were a correspondingly greater amount and variety of macro-invertebrates. The amount and diversity of vegetation in the surrounding area was also greater, showing that there is a relationship between water quality and types and quantities of organisms present.