

Water Quality Inquiry Unit

Introduction:

Freshwater and marine ecosystems are exposed to natural and human impacts that result in change in composition and ability to support life. Lake Indawarra and the Keith Habitat are both artificial water bodies approximately 35Kms apart but exposed to similar climatic conditions. Both habitats are in close proximity to bitumen roads and utilise runoff and stormwater. Lake Indawarra also utilises underground water. Water samples have been tested from each site to determine a baseline for future comparisons. Testing of water from Lake Irrawarra generally occurs monthly throughout the school year.

Inquiry Question:

How is water quality affected by natural conditions and human impact?


Select one of the water habitats ie Lake Indawarra or Keith as your aquatic habitat.

Structuring your inquiry question:

(modified from Fertile Question by Australian Science and Mathematics School – ASMS))



- 1 Brainstorm the different aspects that could be considered when looking at water quality of a freshwater lake (class)
- 2 Decide on a problem related to the lake as a freshwater ecosystem and water quality that you are interested in looking at in more detail
eg
 - how does stormwater runoff affect aspects of water quality – pH, salinity, nitrate content, etc? (students could select one or more aspects to study)
 - how does salinity of water change over time?
 - how does pH of water affect aquatic plant growth?
 - how do seasonal changes affect aquatic plant or animal life?
 - how do seasonal changes affect water quality?
 - etc
- 3 Find 2 other students interested in the same problem and form your group. These could be from participating schools.
- 4 Go to the Moodle link on Creative Thinking for different Creative Thinking techniques.



To enable you to solve your problem, you will need to think creatively to help you define the problem, explore different perspectives and ask better questions. You will need to show that you have used at least one technique (is there a list of techniques that they refer to?) to help you think creatively about your problem. You must document your thought processes to show the development of your ideas.

What do you know? What do you need to know? How can you get this information?

- 5 Define your problem and present it to the class.
 - Propose an hypothesis formed from your problem (students could formulate different hypotheses from the same problem).
 - Identify the independent and dependent variables
 - How will you control your investigation?
- 6 Explore the problem to develop your Action Plan to respond to the aquatic habitat problem.

Action Plan:

(Courtesy of ASMS)

Each group is required to outline their Action Plan to address the problem to be investigated.

The **Action Plan** should include the following:

- a) Statement of the problem you have been investigating and the seriousness of the problem.
 - b) Explanation of what you aim to achieve through your actions.
 - c) Outline the actions you recommend to attempt to solve or address the problem. You are not required to carry out these actions for this task. An explanation of reasons for the planned action ie why do you think this may work?
 - d) Indicate who would be involved in your Plan of Action ie the intended audience, people who would carry out the action, etc
 - e) Provide some examples of your planned action eg scientific posters, media file. This does not have to be something you design or develop from scratch yourself, but could be something done by others with an explanation of how you will use the idea in your Action Plan.
- 7 You will need to locate resources, including people who can assist.
 - 8 Negotiate an appropriate way to present your Action Plan. Your action plan will be assessed through this presentation.