

Water Unit Outline

This is a possible outline as an inquiry based unit where students conduct a science investigation through hands-on inquiry based learning activities. Students are challenged to address authentic problems, issues or research questions relating to a specific freshwater habitat created by humans. The quality of water can be influenced by biotic and abiotic factors and in turn, affects life that exists in that water body.

Teacher lead activities/ practicals could be included where students are required to develop own inquiry research eg directed practical activities on water testing could be included as practical research; practical activities on identification of microscopic and macroscopic aquatic organisms.

NB: the session numbers are suggestions only and will be determined by the year level, length of session (may be more than one lesson) and abilities of the students. More time may be needed for some sessions and less time for others.

SESSION NUMBER	SESSION OUTLINE	SACSA LEARNING OUTCOME
1-2	Identify the process of the scientific method Discussion of independent research, checkpoints, assessments; experimental design; scientific notebook.	
3-4	Develop understanding of equipment used to collect data Practical activities using dataloggers – in laboratory (refer to Moodle for datalogging activities : http://dlb.sa.edu.au/adcmoodle)	
5-6	Field trip to aquatic habitat or virtual visit through Moodle videos/photos Familiarise with location and characteristics of water habitat. Collect data (ongoing throughout unit for host school)	
7	Activities to guide students in the process of how to develop an appropriate inquiry question Brainstorm factors that could affect water quality at Lake Indawarra or Keith habitat pond (or any water body) Begin to define area of personal interest to guide inquiry question Groups formed (possibility to form groups between schools if same area of interest – ie could have combinations from host and client schools).	Science (Earth and Space) 4.1 Identifies and investigates changes, both natural and human-induced, on the earth and suggests ideas which encourage the preservation of the natural environment for all living things F, In, T, KC1, KC6
8	Discussion on valid literary research and how to select reliable and relevant information through Library, internet, ADC Moodle, etc. Emphasis should be on using a range of resources. Teach how to write a bibliography	English (texts and Contexts) 4.3 Reads and views a range of texts containing multiple social and cultural perspectives and examines personal and diverse understandings of the contemporary world.
9-10	Students undertake secondary Research articles on relevant information eg water quality; human impact; etc; Choose reliable and relevant background resources Develop possible Action Plan	English (texts and Contexts) 4.3 Reads and views a range of texts containing multiple social and cultural perspectives and examines personal

	<p>Develop inquiry focus and research questions</p> <p>Document ideas/ questions/ and background research in a notebook format</p> <p>Engage with scientific questions</p> <p>Plan using the scientific process</p> <p>Demonstrate metacognitive awareness; i.e., thinking about learning demonstrated in scientific notebook.</p>	and diverse understandings of the contemporary world.
11-13	<p>Checkpoint 1: Explain focus and questions.</p> <p>Continue literature reviews and scientific notebook work</p> <p>Select equipment that is appropriate for the investigation. Start writing equipment or requirements list</p> <p>Discuss practical activity and explain experimental design. Start experimental design and write experimental method.</p> <p>Trial the techniques and protocol to find improvements and ensure safety</p> <p>It may be possible for client school to request host school to collect specific data to suit their students requirements via Moodle (eg readings from dataloggers, videos, etc)</p>	
14	<p>Checkpoint 2 – discussion of experimental design, lists etc</p> <p>Make modifications where necessary</p> <p>Continue with research use data; videos; etc on moodle</p> <p>If groups formed from different schools, communication via Moodle chat, Centra, or similar</p>	
15-17	<p>Continued literature research and practical research</p> <ul style="list-style-type: none"> ◆ Use data ◆ Represent data in appropriate forms eg. tables & graphs ◆ Gather evidence, formulate explanations, evaluate alternatives, and justify explanations. ◆ Source relevant & reliable information to explain scientific observations <p>Writing up findings in prac report format in scientific notebook</p> <p>Analysis of findings / conclusions</p> <p>Reflection of prac findings – reliability, validity, etc</p>	<p>SCIENCE:</p> <p>Life Systems</p> <p>4.5 Investigates and explains the functioning of living systems from the microscopic to the macroscopic</p> <p>F, In, KC1, KC2</p> <p>4.6 Explores how living things have changed over geological time and debates the value of species diversity and the ethics of human intervention.</p> <p>F, T, C, KC2, KC6</p> <p>MATHEMATICS:</p> <p>Exploring, Analysing and Modelling Data</p> <p>4.1 Poses questions, appropriately designs a survey, collects data and classifies sequence, collapses, tabulates and represents the data with and without ICTs</p> <p>In, T, C, KC1, KC2, KC7</p> <p>4.2 Reads and describes information in given tables, diagrams, line and bar graphs. Makes predictions based on the information, understanding the limitations of the data interpretation</p>
		and the possible social consequences of these limitations.
		In, T, KC2, KC6

18	<p>Discussion of different formats for presentation of scientific research</p> <p>Students to select format for individual presentation of scientific report; powerpoint presentation; scientific poster; etc. (Selections will be archived for future reference – possibly eportfolio)</p> <p>Start planning presentation, represent knowledge in creative ways</p>	
19	Work on scientific presentation	
20	<p>Final session to work on presentation of scientific research</p> <p>Peer review of presentation; modifications Collaborate with peers in critically reviewing their research reports</p> <p>Identify and reflect on areas of individual learning need (in notebook) & respond to peers ideas</p>	
21	Work on oral presentation	
22	<p>Oral presentation</p> <ul style="list-style-type: none"> • Share information, create meaning and communicate with various audiences • Demonstrate understanding of the phenomenon under investigation to an authentic audience 	

Based on information provided by the Australian science & Mathematics School

