**Molesworth Environment Centre: Pond Studies**

The pond studies program at Molesworth can focus on freshwater macro invertebrates, life cycles, requirements of living things, adaptations of organisms or water quality testing.

Incorporation into the Biodiversity program, or Sustainability program are also options.

**Science Scope and Sequence: Foundation to Year 6**

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|  |  | Foundation | | 1 | 2 | 3 | 4 | 5 | 6 |
| **Science Understanding** | **Biological Science** | Living things have basic needs, including food and water.  (ACSSU002) | Living things have a variety of external features.  Living things live in different places where their needs are met. | | Living things grow, change and have offspring similar to themselves. | Living things can be grouped on the basis of observable features and can be distinguished from non-living things. | Living things have life cycles  Living things, depend on each other and the environment to survive. | Living things have structural features and adaptations that help them to survive in their environment. | The growth and survival of living things are affected by the physical conditions of their  Environment. |

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|  |  | **Foundation Year** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| Science as a Human Endeavour | **Nature and**  **development**  **of science** | Science involves observing, asking questions about, and describing changes in objects and events | Science involves observing, asking questions about, and describing changes in objects and events | | Science involves making predictions and describing patterns and relationships | |  | |
| **Use and**  **influence of**  **science** |  | People use science in their daily lives, including when caring for their environment and living things | | Science knowledge helps people to understand the effect of their actions | | Scientific knowledge is used to solve problems and inform personal and community decisions | |
|  |  | **Foundation Year** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| Science Inquiry Skills | **Questioning and Predicting** | Pose and respond to questions about familiar objects and events | Pose and respond to questions, and make predictions about familiar objects and events | | With guidance, pose questions in familiar contexts that can be investigated scientifically and make predictions based on prior knowledge | | With guidance, pose clarifying questions and make predictions about scientific investigations | |
| **Planning and Conducting** | Participate in guided investigations and make observations using the [senses](http://www.australiancurriculum.edu.au/Glossary?a=S&t=senses) | Participate in guided investigations to explore and answer questions | | With guidance, plan and conduct scientific investigations to find answers to questions, considering the safe use of appropriate materials and equipment | |  | |
| **Processing and analysing data and information** | Engage in discussions about observations and represent ideas | Through discussion, compare observations with predictions | |  | |  | |
| **Evaluating** |  | Compare observations with those of others | |  | | Reflect on and suggest improvements to scientific investigations | |
| **Communicating** | Share observations and ideas | Represent and communicate observations and ideas in a variety of ways | | Represent and communicate observations, and ideas and findings using formal and informal representations | |  | |

**Options for investigations at Molesworth linked with the Science and Sustainability Curriculum**

1. Investigate how pond organisms/minibeasts go about collecting food and oxygen.
2. Discuss other requirements for survival such as shelter and finding a mate.
3. Examine the amazing features of a selection of pond creatures and discuss the similarities and differences between different organisms. Eg compare features for food collection, reproduction, respiration and so on.
4. Identify ways that these features meet the needs of the organism in an aquatic environment.
5. Examine the fascinating range of ways minibeasts grow – eg growing external skeletons compared with growing larger within their soft skin.
6. Investigating how macro invertebrates change over their life, eg from larva or nymph to winged insect.
7. Explore the similarities and differences between adults and young invertebrates.
8. Introduce basic classification of the animal world, by discussing the important features of insects, arachnids, gastropods, roundworms, flatworms and so on.
9. Discuss why classification is important in science.
10. Observe the features of living things compared to non- living things, eg growth, respiration, reproduction, movement, excretion, and so on. Discuss how mini-beasts go about these activities.
11. Detailed examination of the various life cycles of pond mini-beasts. Discuss the differences between larval and nymphal metamorphosis and compare to humans.
12. Discuss sexual compared with asexual reproduction.
13. Examine the pond ecosystem as a whole and discuss the interrelationship between the pond plants and animals and their dependence on each other for survival.
14. Introduce the concept of energy in an ecosystem.
15. Discuss the range of physiological and behavioural adaptations, for example in the insect kingdom, often the young organism will live in a different habitat from the adult to reduce competition on food resources.
16. Investigate evolution of mouth parts for feeding, and structural features of insects that limit their physical size.
17. Investigate predator-prey relationships.
18. Conduct animal activity studies on the behaviour of pond macro invertebrates.
19. Compare a pond habitat with the creek at Molesworth.
20. Conduct some water quality testing and discuss how pollution affects the conditions of a habitat.
21. Look, feel, listen and smell the pond ecosystem.
22. Imagine what it would be like to be a pond creature.
23. Generate questions about who lives at the pond and why?
24. Make predictions about the kinds of animals you would find at the pond and describe some similarities these creatures might have.
25. Predict how the pond might change over the course of a year or in relation to extreme weather events.
26. Predict how human actions influence the pond ecosystem.
27. Discuss how Aboriginal People of Tasmania may have understood the pond ecosystem

**The Pond program at Molesworth links with the following cross curriculum Sustainability organising ideas.**

Systems

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| OI.1 | The biosphere is a dynamic system providing conditions that sustain life on Earth. |
| OI.2 | All life forms, including human life, are connected through ecosystems on which they depend for their wellbeing and survival. |
| OI.3 | Sustainable patterns of living rely on the interdependence of healthy social, economic and ecological systems. |

Futures

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| OI.6 | The sustainability of ecological, social and economic systems is achieved through informed individual and community action that values local and global equity and fairness across generations into the future. |
| OI.7 | Actions for a more sustainable future reflect values of care, respect and responsibility, and require us to explore and understand environments. |
| OI.8 | Designing action for sustainability requires an evaluation of past practices, the assessment of scientific and technological developments, and balanced judgments based on projected future economic, social and environmental impacts. |
| OI.9 | Sustainable futures result from actions designed to preserve and/or restore the quality and uniqueness of environments. |