Teacher's Resource Pack

Stage 4 & Stage 5

Science

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SYDNEY SEA LIFE AQUARIUM

MERLIN ENTERTAINMENTS GROUP

Welcome to SEA LIFE Sydney Aquarium's Science Student Resources

Teacher Notes

A trip to SEA LIFE Sydney Aquarium, offers a wealth of opportunities to align your Science program, with both the NSW Syllabus and the incoming Australian Curriculum.

The worksheets within this resource, can be completed by students when they visit SEA LIFE Sydney Aquarium. Within this resource is also Pre and Post learning tasks for completion at school.

Stage 4

Outcome 4.8: A student describes the features of living things
4.8.2 Classification

- Classify living things according to structural features and identify that they have patterns of similarities and differences.
- Identify a range of plants and animals using simple keys

4.8.4 Multicellular Organisms

- Identify that there is a wide range of multicellular organisms.

Outcome 4.9: A student describes the dynamic structure of the Earth and its relationship to other parts of our solar system and the universe.
4.9.5 The Hydrosphere

- Describe the water cycle in terms of the physical processes involved.
- Describe the effect of the forces of the sun and the moon of the hydrosphere.

Outcome 4.10: A student identifies factors affecting survival or organisms in an ecosystem.
4.10 Ecosystems

- Describe some adaptations of living things to factors in the environment.
- Describe, using examples of food chains and food webs from Australian ecosystems, how producers, consumers and decomposers are related.
- Describe the roles of photosynthesis and respiration in ecosystems.
- Discuss the effects of bushfires, droughts and flood on Australian ecosystems.

Outcome 4.11: A student identifies where resources are found, and describes ways in which they are used by humans.
4.11 Natural Resources

- Distinguish between natural and made resources.
- Give examples of resources from living things and resources extracted from air, Earth and Oceans.

Stage 5

Outcome 5.8: A student relates the structure and function of living things to models, theories and laws.
5.8.3 The Theory of Evolution and Natural Selection

- Discuss evidence that present-day organisms have evolved from organisms in the distant past.
- Relate natural selection to the theory of evolution.

Outcome 5.10: A student assesses human impacts on the interactions of biotic and abiotic features of the environment.
5.10 Ecosystems

- Distinguish between biotic and abiotic features of the local environment.
- Describe the importance of cycles of materials in ecosystems.
- Describe some impacts of human activities on ecosystems.

Outcome 5.11: A student analyses the impacts of human resources on the biosphere to evaluate methods of conserving, protecting and maintaining Earth's resources.
5.11.2 Waste from Resource Use

- Relate pollution to contamination by unwanted substances.
- Discuss strategies use to balance human activities and needs in ecosystems with conserving, protecting and maintaining the quality ad sustainability of the environment.

Suggestions for Pre/Post activities

Pre-Activities:

- Look at the classification of organisms.
- Look at the adaptation of organisms to different environments.
- Study biotic and abiotic factors.
- Look at food chains and study different aquatic food chains (of a coral reef, a near shore environment, a rock pool and the Antarctic ocean for example).
- Look at different environments/habitats and link this to how organisms are adapted to living there.

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Post-Activities:

- Research conservation practices carried out in Australia and worldwide.
- Look at the theory of Evolution, asking students which animals they believe are closely related, and according to the theory, which organisms evolved from what.
- Construct a classification guide, using animals found within Sydney Aquarium.
- Visit the SEA LIFE Conservation Fund website, to find out the many ways you and your students can contribute to protecting our ocean creatures. http://www.slcf.org.au/

Stage 4 Science

When classifying animals, we group animals together with similar features or characteristics. This is not always as easy as it sounds, as some of the differences can be with their internal features, what they eat and where they live. As you tour SEA LIFE Sydney Aquarium, look out for different animals and think about how they would be classified.

Fill in the table below, using information you find on your trip to SEA LIFE Sydney Aquarium.

	Example within the aquarium	Why does it belong to this grouping?
Bony fish		
Cartilaginous fish		
Reptile		
Bird		
Mammal		
Arthropod		
Echinoderm		

What are some of the differences between the bony fish and the cartilaginous fish?

Which animals in SEA LIFE Sydney Aquarium are difficult to classify?

Stage 5 Science

All animals are named using a formal scientific system of naming. This is called the binomial naming system. Each animal is given a two-part name (two words). This is usually written in italic writing and sometimes underlined (also, the second word always starts with a lower case letter). E.g.:

Great White Shark – *Carcharodon carcharias*

When you tour SEA LIFE Sydney Aquarium, look for the scientific name for animals next to their everyday names. In the table below, make a list of 10 different animals that you see.

COMMON NAME	SCIENTIFIC NAME

In your table above, are there any animals with similar names? If so, what are they. If not, why do you think this is?

Why do you think that all organisms are named in this way? What use is there and do you think it can be problematic in any way?

Marine & Aquaculture Technology

STAGE 4

SEA LIFE Sydney Aquarium houses lots of different marine organisms as well as freshwater organisms too.

What is a marine environment and why is it different to a terrestrial environment or freshwater environment?

For each of the following animals, give an example of one you saw at SEA LIFE Sydney Aquarium:

Marine mammal:

Dangerous marine animal:

Crayfish:

A mangrove dwelling organism:

A bony fish:

A cartilaginous fish:

SEA LIFE Sydney Aquarium is proud of the conservation work it is involved in. Write down two conservation tips or conservation facts you have seen in the aquarium.

Marine & Aquaculture Technology

STAGE 5

The tanks and pools in which the organisms live are routinely monitored and controlled to ensure that the environment inside the tank is as close to their natural habitat as possible. What are they monitoring and why?

In what other ways have the staff at SEA LIFE Sydney Aquarium ensured that the organisms' habitats are as close to their natural habitat as possible?

After looking around SEA LIFE Sydney Aquarium, what is your view on aquariums and zoos? Do you think they are a positive conservation learning tool, with important breeding programs for endangered animals. Or, do you think they are bad for holding animals in captivity that otherwise would be wild? Explain your answer.