Follow Up Activities and Questions

Curriculum Reference

Kindy - Pre Primary

Science - Understanding Concepts

Life and living
Students understand the biology of other living things and recognise the interdependence of life.

Students understand the relationship between structure and function in living things and use that as a basis for understanding life maintaining processes.

Key Concepts

- The diversity of life under the sea.
- Some animals have teeth, skin, bones alike us - yet they can be quite different to ours and serve different functions.
- Some creatures do not have a heart, brain, eyes, nose or ears; yet they are still animals and are alive.

Follow Up Questions

- **How does a starfish eat?** It 'spews' its stomach on top of its food, then slowly absorbs it.
- **Do all animals have eyes, ears and a nose like us?** No (think jellyfish, starfish, and corals).
- **How can you tell a fast from a slow shark?** Fast sharks have a forked tail and a tall top fin.
- **Why do stingrays have gooey skin?** The goo on their skin has built-in sunscreen! It also helps them glide easily through the water.
- **Why do fish have slimy skin?** It creates a barrier, keeping bad stuff (bacteria/bugs) out and keeping fresh water in! It also helps them glide easily through the water.
- **What was the sharks skin like?** Rough! It's covered in "skin teeth" which stop bugs and other bad things from being able to stick on.
- **Fish can use their teeth for more than just eating- can you think of any fish that used their teeth in a unique way?**
  - Anemonefish chatter their teeth to create an aggressive noise and defend their home.
  - Old wives grind their teeth loudly to make an alarm and warn of danger.

Follow Up Activities

- Patterns and Prints: Investigate the colour and patterns of sea creatures. Why do you think they are the colours that they are?
- Creature Creations: Use Lego or arts and crafts products to "create your own sea creature" using features that they have learnt about. EG. colours for camouflage, big top fins for going fast, lots of noses for sniffing food etc.

Follow Up Activities and Questions

Curriculum Reference

Science – Understanding Concepts

Life and Living
Students understand the relationship between structure and function in living things.

Year 1-3

Key Concepts

- An animal's body shape is related to the environment in which it lives.
- Every fin on a shark's body plays a role in how it swims.
- The unique features of animals all have a special purpose which helps them to survive.

Follow Up Questions

- **What is a shark's skeleton made of?** Cartilage, like what's in your nose and ears.
- **Is a sharks skin smooth or rough? What is it made of?** Rough; its made of dermal denticles which means "skin teeth" and it stops things from sticking onto the sharks skin.
- **What do the side (pectoral) fins do?** Steer left and right.
- **What shape does a shark's body resemble?** Torpedo shaped, like a plane.
- **Why are a shark's eyes on top of its head ?** This helps it see above, where most of its food is.
- **What tooth shape is ideal for ripping and tearing?** Triangular teeth with serrations like a knife. Not all sharks have these teeth.
- **How do sharks find their food?** Using all of their senses, especially their 6th sense called 'electroreception'; which is the ability to sense the electric pulses made by living animals.

Follow Up Activities

Shapes

At AQWA you will see many different sea creatures with very different body shapes and plans. Think about how sharks are shaped like an aeroplane, jellyfish like a ball and stingrays are like a pancake! Cut out different shapes and see how many different sea creatures they can create using combinations of these shapes. For example:

- A circle could become a jellyfish, octopus, stingray, coral or globefish.
- A triangle can become an eagle ray. Lots of triangles can become a starfish or the fins of fish or sharks.
- A thin oval / cylinder can become the body of a crocodile, an eel or a cleaner wrasse.

Teeth

When people think of sharks they normally think of teeth straight away. At AQWA you will see different sharks jaws to see the different kinds of teeth they have and even pat a shark that has teeth that are safe to us! With your class explore whether all the teeth in our mouth are the same. What do we use the different shaped ones for?

Follow Up Activities and Questions

Curriculum Reference

Science – Understanding Concepts

Years 4-6

Life and Living
Students understand their own biology and that of other living things, and recognise the interdependence of life.

Students understand the nature of science as a human activity.

Key Concepts

- Animals have different roles in an ecosystem and these roles interact with each other.
- Coral reefs are living structures built by coral polyps.
- Humans use classification to group living things to help understand the natural world.
- Humans reserach and draw conclusions about their natural wrorld through observation.

Follow Up Questions

- **Why is a coral reef like an ocean oasis?** In nutrient poor waters, with little else around, corals are able to form a habitat by creating living structures. Many sea creatures can live in this habitiat and they share and recycle resources. This is like an oasis in the desert.
- **How do corals get the energy to build a reef?** Tiny algae lives inside them. The algae uses photosynthesis to make food/energy that the coral can also use to make limestone and therfore build the reef.
- **What role do predators play?** They 'pick off' the weak, sick and injured, stopping the spread of disease/problems. They also maintain a 'food chain' and prevent over-crowding which can lead to strained resources.
- **How do fish keep clean?** Cleaner fish and shrimps. They have a 'symbiotic' relationship where the cleaner and the fish both benefit.
- **What are some of the different features of coral reef fish?** Patterns for camouflage, especially stripes. Rounded tails and large side fins, to change diraction quickly. Thin bodies for slipping into the crevaces of the reef.
- **Bony fish, sharks and rays are all types of fish and are closely related. Through your observations at AQWA, did you notice how sharks, fish and rays breathe?** Sharks have 5-7 gill slits and push water over their gills by moving their body or mouth. Fish also do this, but have just 1 gill slit on each side. Stingrays have 'spiracles' that suck water to their gills and have 10 gill slits under their body.

Follow Up Activities

City of the Sea

- At AQWA you discovered the roles that different animals play within an ecosystem. As a class research other animals and discover the roles that they play in their ecosystem. Then either create your own ecosystem from your imagination and select or create animals to live in it; OR discuss with your class the different equipment humans need to use when entering a different environment e.g. scuba divers or mountain climbers.

Follow Up Activities and Questions

Curriculum Reference

Science – Understanding Concepts

Years 7-9

Life and Living

Students understand the relationship between structure and function in living things and use that as a basis for understanding life maintaining processes.

Students can describe how organisms reproduce.

Key Concepts

- Animals develop adaptations to survive in their environment.
- The difference between endothermic and ectothermic animals.
- Diversity of life under the sea.
- The same groups of animals may possess different 'morphology' that assist in their survival.
- Marine animals may use different reproductive strategies at different stages of their life.
- Different groups of marine animals may use the same reproductive strategy.

Follow Up Questions

- **What reptiles did you meet at AQWA; did they live on land, in the water or a combination or both?** Marine turtles; live in water, lay eggs on land. Saltwater crocodiles; move between water and land. Sea snakes; live entirely in the water, including for birthing.
- **Are saltwater crocodiles ectothermic or endothermic?** Ectothermic; regulation of body temperature depends on environment.
- **Do all corals grow the same? Identify different shapes you found at AQWA**: No. You commonly see; plates; vases; branches and mounds.
- **What could affect the way a coral grows?** Wave motion, water clarity, amount of sunlight.
- **Fish and corals are in distinct biological groups but they can reproduce in the same way. How?** By spawning/releasing gametes into the water.
- **They reproduce the same, but do they grow the same?** No. Corals can use binary fission to split and grow a colony. Fish mature into an adult form.
- **Animals can have different life phases; jellyfish have 2. What are they?** A polyp, attached to and growing from a substrate; or a medusa, floating in the water.
- **Why are some sea creatures toxins deadly to us, but won't harm its predator?** Over time and through exposure, predators can adapt to their prey's defences. As we are not exposed over time, we do not adapt.

Follow Up Activities

Design like Mother Nature

- Have your students design a marine creature. Have them consider; Where in the ocean will it live? Is it endothermic or ectothermic? How is it adapted to its habitat? How will it catch its food? How will it protect itself from predators? How will it reproduce?

Follow Up Activities and Questions

Curriculum Reference

Science – Understanding Concepts

Years 10-12

Life and Living
Students understand the relationship between structure and function in living things and use that as a basis for understanding life maintaining processes.

Reproduction, genetics and biotechnology
Through the investigation of a variety of different cell contexts, students will develop an understanding of concepts and skills relevant to biotechnoloy.

Students can describe how organisms reproduce

Technology and Enterprise - *Enterprise*
Students pursue and realise opportunities through the development of innovative strategies designed to meet human needs.

Key Concepts

- Animals develop adaptations to survive in their environment. Adaptations can be structural, physiological or behavioural.
- The unique adaptations of marine life are being studied by scientists to develop exciting new and improved products and medicines.
- Humans use scientific classification systems to group living things and help them understand their natural world. Classification is based on many features that may not be visually apparent (i.e. coral).
- Marine animals may use different reproductive strategies at different stages of their life. Different groups of animals may use the same reproductive strategy.
- The same groups of animals may possess different 'morphology' that assist in their survival.

Follow Up Questions/Further Research

- Mussels are able to stick onto wet rocks and jetty pylons, despite strong wave motion. What products have been developed through the study of this adaptation?
- How is seaweed gel used in human products?
- What marine animals are being studied so that we can learn more about our own development and nervous system?
- What features of sponges has made them of interest to scientists researching a cure for cancer?
- What products have been (or are being) developed from corals?
- How does a cuttlefish move up and down in the water column?
- Why can a coral be considered an Animal, Vegetable and Mineral?
- How does the Leeuwin current affect the marine life found off Perth?
- List the adaptations that help saltwater crocodiles find; capture; and efficiently digest their food. Classify each adaptation as either structural, physiological or behavioural.

Follow Up Activities and Questions

Continued

Years 10-12

- What is one of the main reasons reptiles have been so successful in dominating land environments?
- Name three examples of asexual reproduction.
- Name at least 3 different groups of marine animals that lay/release eggs.
- What role did temperature play in the reproduction of turtles?
- What benefit is there to corals spawning at the same time?
- What is thought to trigger coral spawning?
- Are all eggs designed to float? What are the advantages and disadvantages of releasing eggs and sperm into the water column?
- What animals displayed some degree of parental care?
- What animals underwent sex-changes? How does this strategy help survival of the species? How did it differ between the different examples? Why?

Follow Up Activities

Survival of the fittest

- Have your students select a marine animal from AQWA and name their physiological, structural and behavioural adaptations that allow them to survive in their particular part of the ocean. Imagine the threats faced by this animal in the future due to environmental pressures such as climate change, habitat destruction and food chain disruptions. Have students come up with a suite of adaptations this animal could develop if it was to survive for another 5,000 years.

Designed by nature, created by you!

- Have your students select a sea creature and create a list of its special features. Select one of these special features and create a product for human use based upon it. Once your students have created a blueprint of their product, have them make a promotional poster and present a product briefing to the class.

Cryptic Classification

- At AQWA you will have discovered closely related animals that featured different morphology. From your notes at AQWA or with further research, discover 2 animals that you would not have thought were related based on their external morphology (visual features) and list their common features (EG. corals and jellyfish). Can you identify any sea creatures that appear outwardly identical, but are scientifically distinct species?