

Activities and Resources

Under the Sea: Coral Reefs

Welcome to Questacon's Under the Sea: Coral Reefs. In this session, students will investigate the different ways that scientists study coral reefs and explore how coral are affected by changing conditions. This document provides information to prepare you and your students for the session.

Included in this document is an outline for the webinar, materials list, safety considerations, and ideas for extension activities to help maximise your students' learning from our virtual excursion.

What to Expect

In this session, students will learn what coral are, the different methods used to collect data and study Australia's reefs, and the best conditions for coral to thrive in.

Students will investigate how the different properties of materials impact the tools and technologies used to study the reefs, and model research practices using everyday materials.

On the day

- Make sure you have materials on hand. The presenter will give verbal cues as to which activities will be coming up next and go through the activity instructions with the students.
- Your role during the virtual excursion will be to help facilitate students through activities and act as your class's 'voice'.
- Stay by the keyboard as you'll need to enter student answers or observations using our polls and the Q and A.

Materials

For Paper Polyps each student will require:

- Coloured paper
- Coloured markers
- Safety scissors
- Tape or glue
- An object to build on (e.g. chair, lunchbox)

For Float or Sink? each class will require:

- Container of water
- Items that can be placed in water
- Towel to clean any spills

Safety

The risk of injury while participating in the experiments is low. Be mindful that students are acting with care with materials, and that they are supervised while conducting their investigations.

If you have concerns about how your students will handle some information, speak to our presenters at the start of the session or email us.

Contact us!

Have any questions? Email us at:
digitaloutreach@questacon.edu.au



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Under the Sea: Coral Reefs – Run Sheet

Runtime: 60 minutes

Please note these times are approximations, and programming on the day may change to give participants the most impactful and enjoyable experience possible.

Time	Segment Description	Notes
5 min BEFORE	Audio visual check	Session will open for classroom to join. This is a good opportunity to ensure your tech set up works and your whole class can see and hear the presenter.
0-3 min	Introduction to excursion	The facilitator will quickly run through the features of the webinar and how they will be interacting throughout the session.
3-9 min	Coral reef ecology and physiology	Facilitator will discuss with students the structure of coral reefs, the inhabitants of coral reefs, and how they contribute to the overall environment.
9-23 min	Activity: Paper Polyps. Modelling coral reefs	Facilitator will demonstrate how to construct a paper coral polyp and participants can create their own to build a model coral reef. Then we'll discuss how scientists use models to understand scientific concepts.
23-29 min	Studying the Great Barrier Reef with AIMS	Facilitator introduces the Australian Institute of Marine Science and their programs. We'll explore different methods of surveying reef health, and some of the jobs and tools required.
29-44 min	Activity: Float or sink?	Students explore properties of different materials and consider their suitability for use as tools for underwater exploration.
44-47 min	Environmental factors that affect coral	Presenter discusses coral bleaching and environmental conditions like ocean temperature and pH that affect coral health.
47-53 min	Testing pH	Presenter explains pH and demonstrates how to use red cabbage indicator to test pH levels of common household substances.
53-60 min	Reflection and conclusion	Presenter will summarise the excursion, highlighting the various roles involved in coral reef conservation.



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Under the Sea: Coral Reefs – Paper Polyps

Before the session:

Gather your materials:

- Coloured paper/plain paper
- Safety scissors
- Coloured markers
- Tape/glue
- An object to build on (e.g. chair, lunchbox)

During the session:

1. Cut paper into small pieces, for example cut an A4 paper into 8 small rectangles.
2. Mark small dots all over both sides of the paper with a coloured marker. These represent the polyp's zooxanthellae.
3. Cut part-way along the length of the paper at even intervals to create a fringe. These will become the polyp's tentacles.
4. Roll the fringed paper into a tube.
5. Secure the roll with tape or glue.
6. Gently separate the fringe sections.
7. Attach coral polyp to chosen object with tape or glue.
8. Repeat as desired.

Extension ideas:

- Add models of other animals to your coral reef ecosystem.
- Try different ideas to represent a coral's exoskeleton.

Under the Sea: Coral Reefs – Float or Sink?

Before the session:

Gather your materials:

- Container of water (Can also fill up a sink)
- Items that can be placed in water Towel to clean up any spills
- Towels to clean up any spills

During the session:

1. Collect a variety of different objects to test in the water. Test objects of different sizes, shapes, materials etc.
2. Before placing an object in the water, guess whether it will float or sink.
3. Place each object in the water and observe what it does, did it match your guess?

Extension ideas:

- Try to find materials that will float or sink depending on their shape. A ball of plasticine will behave differently to a plasticine boat of the same weight.
- Try changing the density of the water by adding salt (make a 5% salt solution by adding 25g of salt to 500ml of water). Compare how your objects float or sink now to what they did in fresh water. Did anything change?
- Make models of boats/subs that we might use to study the reef and seabed. Can you adjust the buoyancy so it both sinks and floats as needed?

More experiments

Visit the Questacon website for more activities: <https://www.questacon.edu.au/learn-and-play/activities>



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Under the Sea: Coral Reefs – Extension Activities

Listed below are optional extension activities and links to further your students' learning.

Red cabbage indicator

Equipment:

- Chopped red cabbage
- Heat resistant container
- Hot water
- Containers for testing substances
- Acidic substances (e.g. lemon juice, vinegar)
- Alkaline/basic substances (e.g. bicarbonate soda, washing powder)

Instructions:

- Place chopped cabbage into heat resistant container.
- Cover with hot water for 10-15 minutes.
- (Optional) Strain to separate cabbage from liquid.
- Test the pH of substances in separate containers.
- Compare colour to chart below to determine pH, from very acidic (1), to neutral (7), to very basic (14)

Tip

Dissolving powdered substances into water first may yield clearer colour changes.



Image © Andy Brunning/Compound Interest 2017



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AUSTRALIAN INSTITUTE
OF MARINE SCIENCE

The Australian Institute of Marine Science's research supports the sustainable use and protection of our oceans.

Find out more at: <https://www.aims.gov.au/>

DEADLY SCIENCE

Deadly Science delivers resources and programs to ensure regional and remote schools can create effective STEM learning experiences that include First Nations science.

Find out more at: <http://deadlyscience.org.au>



SEAWEEK
AUSTRALIA

SeaWeek is coordinated by the Australian Association for Environmental Education.

For more SeaWeek resources visit:
<https://www.aeee.org.au/seaweeek/newresources/>

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Under the Sea: Coral Reefs – Curriculum Links

Listed below are links to curriculum to inform the connection between our interactive session and how they could apply to further learning in the classroom. These links are drawn from ACARA's Science curriculum (Version 9.0).

Science

Science understanding (Biological sciences)
In the virtual excursion, students explore the key features of coral as an animal, how coral changes throughout its life, the relationships coral can have with other organisms, and how they are impacted by changes in their environment.

Year 3 - Living things can be grouped on the basis of observable features and can be distinguished from non-living things. (ACSSU044)

Year 4 - Living things have life cycles. (ACSSU072)

Year 5 - Living things have structural features and adaptations that help them to survive in their environment. (ACSSU043)

Year 6 - The growth and survival of living things are affected by physical conditions of their environment. (ACSSU094)

Science as a human endeavour

In the virtual excursion, students look at how data can inform understanding of coral reef health, as well as exploring scientists may use scientific knowledge to identify problems and develop solutions.

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Year 3/4

Nature and development of science - examine how people use data to develop scientific explanations. (AC9S3H01, AC9S4H01)
Use and influence of science - consider how people use scientific explanations to meet a need or solve a problem. (AC9S3H02, AC9S4H02)

Year 5/6

Nature and development of science - examine why advances in science are often the result of collaboration or build on the work of others (AC9S5H01, AC9S6H01)
Investigate how scientific knowledge is used by individuals and communities to identify problems, consider responses and make decisions (AC9S5H02, AC9S6H02)

Science inquiry

In the virtual excursion, students participate in a range of activities to build their inquiry skills. The skills range from modelling to represent coral reef structure, conducting open-ended investigations on material properties and how they may impact the development of scientific technology, and using both qualitative and quantitative data to understand how changes in the environment impact coral health.

All year levels

- Questioning and predicting
- Planning and conducting
- Processing, modelling and analysing
- Evaluating
- Communicating