



Teachers Mini-Module Lesson Plan

How Do Scientists Grow Coral? - Frame Cleaning

Mini-Module Summary

This five-minute lesson introduces students to CCMI's coral restoration programme and allows them to "dive" into one of the Little Cayman coral nurseries. In this mini-module, the CCMI educator, Katie, will give a brief history as to why reef restoration is so important to the marine environment, what CCMI is doing to facilitate restoration efforts, and how the students can get involved and help with restoration. Using this video, students learn what corals actually are, how they are grown in a nursery environment, and some of the methods scientists use to take care of them, such as cleaning. Students and teachers will be given an activity sheet to assist with understanding the importance of these corals, coral reef ecosystems, and coral nurseries.

Curriculum Aim - Years 4 and 5

Learning objectives

- Define a coral and a coral nursery
- Explain why coral nurseries are so important
- Summarize the scientific method scientists use to grow coral
- Report on the difficulties and challenges scientists face with coral nursery work
- Organize a volunteer effort to assist with a local coral nursery

The Cayman Islands - Science National Curriculum Alignment

- Observe similarities and differences among animals and among plants (Year 4).
- Find out about other animals, including how they grow, feed, move and use their senses (Year 4).
- Investigate a local habitat, including the relationship between the animals and plants found there, and develop skills in classifying animals and plants by observing external features, *for example, classify minibeasts by observing the number of legs and note the conditions in which they were found* (Year 4).
- Investigate the conditions necessary for the growth of familiar plants including light, heat and water, *for example, place plants in different environments, varying the light, water and temperature and observe the results* (year 5).

Necessary materials

Internet connection, YouTube.com classroom account, computer, projector, speakers, note paper, pencils or pens, and activity sheet (one per student)

Useful resources

- www.reefresearch.org/reefs-go-live
- www.projectaware.org
- www.doe.ky
- www.education.gov.ky/education/curriculum
- www.caymanecodivers.com/cayman-coral-nursery-program/



Teachers Mini-Module Glossary

How Do Scientists Grow Coral? - Frame Cleaning

Climate change - change in global weather patterns over time, much of which can be attributed to the effects of increased carbon dioxide in the atmosphere from human activities

Coral nursery - place where scientists grow corals underwater on specialized structures with the goal of replenishing depleted coral reefs from what is grown in these places

Coral reef - marine structure composed of a layer of living coral atop coral skeletons, minerals, and organic matter

Endangered - in great danger or at risk of becoming extinct

Hermatypic coral - stony coral; a coral that helps build the reef and becomes limestone over time

Macroalgae - large algae with thick blades that often live attached to a substrate in dense beds

Outplanting - transplanting of corals from a nursery onto a reef or other structure in the ocean

Photosynthesis - process by which green plants convert carbon dioxide and water into organic chemicals using light energy from the sun with oxygen released as a by-product

Polyp - tiny, soft-bodied animal related to jellyfish and sea anemones, which lives in a colony and forms coral reefs

Reef health - a simple observation of the status of coral reefs using key indicators, scientific measurements, and the presence or absence of certain organisms



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Teachers Mini-Module Vocabulary Assessment

How Do Scientists Grow Coral? - Frame Cleaning

Below is a list of 10 vocabulary terms used in the Reefs Go Live Mini-Module “How Do Scientists Grow Coral? - Frame Cleaning”. Show the CCMI Educator that you understand the concepts demonstrated in this mini-module by matching the definition on the right with the correct term on the left. Thanks for your help and good luck!

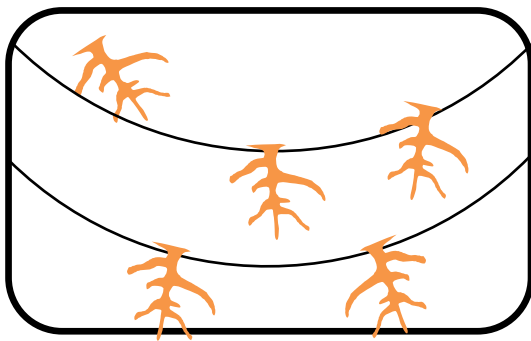
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|----------------------------|--|
| 1. Climate change: _____ | a) process by which green plants convert carbon dioxide and water into organic chemicals using energy from the sun with oxygen released as a by-product |
| 2. Coral nursery: _____ | b) marine structure composed of a layer of living coral atop coral skeletons, minerals, and organic matter |
| 3. Coral reef: _____ | c) large algae with thick blades that often live attached to a substrate in dense beds |
| 4. Endangered: _____ | d) a simple observation of the status of coral reefs using key indicators, scientific measurements, and the presence or absence of certain organisms |
| 5. Hermatypic coral: _____ | e) stony coral; a coral that helps build the reef and becomes limestone over time |
| 6. Macroalgae: _____ | f) place where scientists grow corals underwater on specialized structures with the goal of replenishing depleted coral reefs from what is grown in these places |
| 7. Outplanting: _____ | g) transplanting of corals from a nursery onto a reef or other structure in the ocean |
| 8. Photosynthesis: _____ | h) in great danger or at risk of becoming extinct |
| 9. Polyp: _____ | i) tiny, soft-bodied animal related to jellyfish and sea anemones, which lives in a colony and forms coral reefs |
| 10. Reef health: _____ | j) change in global weather patterns over time, much of which can be attributed to the effects of increased carbon dioxide in the atmosphere from human activities |



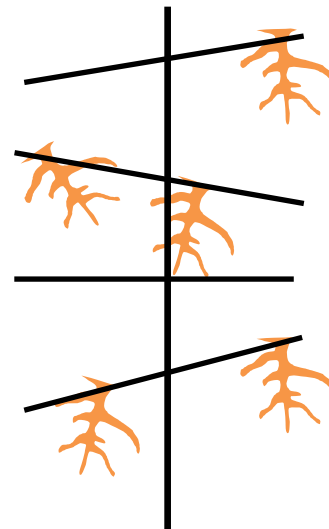
Teachers Mini-Module Activity Sheet (Students)

How Do Scientists Grow Coral? - Frame Cleaning

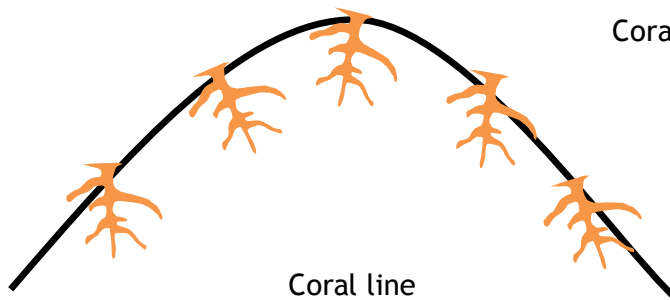
Today, you're the scientist! As you saw demonstrated by Katie, CCMI has several methods of growing corals in the Little Cayman underwater nurseries. ALL of these structures need to be cleaned once a month. Below are three of the structures we use to grow corals: coral frame, a coral tree, and a coral line. As you can see, macroalgae is growing on them as well. This macroalga (either red, green, or brown algae) is the "bad" algae that Katie demonstrates cleaning off the nursery structures in the Reefs Go Live mini-module on "Frame Cleaning". With the cleaning brush provided at the bottom of this worksheet, scrub your nursery structures clean of the macroalga while taking care not to scrub the corals themselves. This is excellent practice for cleaning real underwater coral nursery structures someday, which you can do if you volunteer with one of Cayman's underwater coral nurseries. Thanks for your help. Happy cleaning!



Coral frame

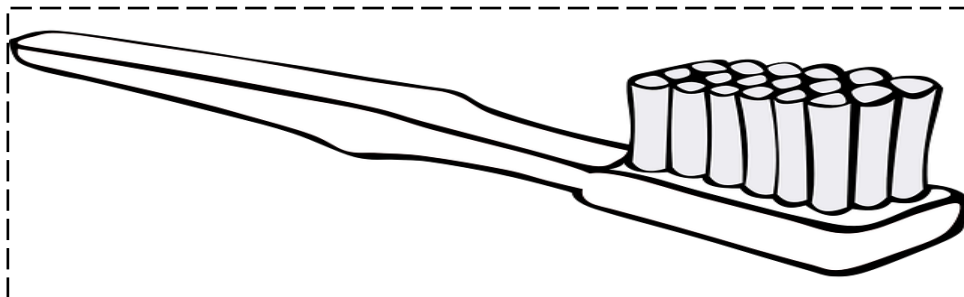


Coral tree



Coral line

Cut here 





Teachers Mini-Module Activity Sheet (Teachers)

How Do Scientists Grow Coral? - Frame Cleaning

Teachers, to assist with the student's activity sheets on "How do Scientists Grow Coral - Frame Cleaning" we need your help! Before starting the lesson, please print and cut out all of the macro-algae below, and distribute them equally between all of the students' activity sheets. This will help them gain "experience" cleaning the different kinds of coral nursery structures. To affix the algae to the different nursery structures on the students' worksheets, you can use glue sticks, tape, double-sided tape, Elmer's glue, etc., whatever is easiest and available in your classroom. After the students watch the Reefs Go Live Mini-Module on "Frame Cleaning", they can use their coral-cleaning brush to 'scrub' their coral nurseries clean, just as Katie demonstrated in the video. Print off as many algae sheets as you need so all students have the chance to clean each structure. Thanks once again for your help in getting your students involved with coral nurseries or terrestrial plant nurseries!

