



Teachers Lesson Plan

How Do Scientists Grow Coral? - Frame Cleaning

Mini-Module Summary

This lesson introduces students to CCMI's coral restoration programme and allows them to “dive” into one of the Little Cayman coral nurseries. In this live lesson, our CCMI Educators will give an introduction to coral biology and ecology before explaining 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. In this lesson, 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 Aims: Key Stage 1 and 2

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

- Performing simple tests and investigations (Years 1 and 2)
- Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on one another (Year 2)
- Find out about and describe the basic needs of animals, including humans, for survival (Year 2)
- Identify that animals, including humans, need the right types and amount of nutrition, and they cannot make their own food; they get nutrition from what they eat (Year 3)
- Recognise that environments can change and that this can sometimes pose dangers to living things (Year 4)
- Describe the life process of reproduction in some animals and plants (Year 5)
- Give reasons for classifying plants and animals based on specific characteristic (Year 6)

Necessary materials

Internet connection, YouTube.com classroom account, computer, note paper, pencils or pens, activity sheet, plain paper, 4 paper straws [or: wood sticks (x8), popsicle sticks (x8), skewer sticks (x8), pieces of paper(x8) toothpicks (x16)], tape, nylon thread [or: dental floss, yarn, string, twine]



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 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



Student Vocabulary Assessment

How Do Scientists Grow Coral? - Frame Cleaning

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

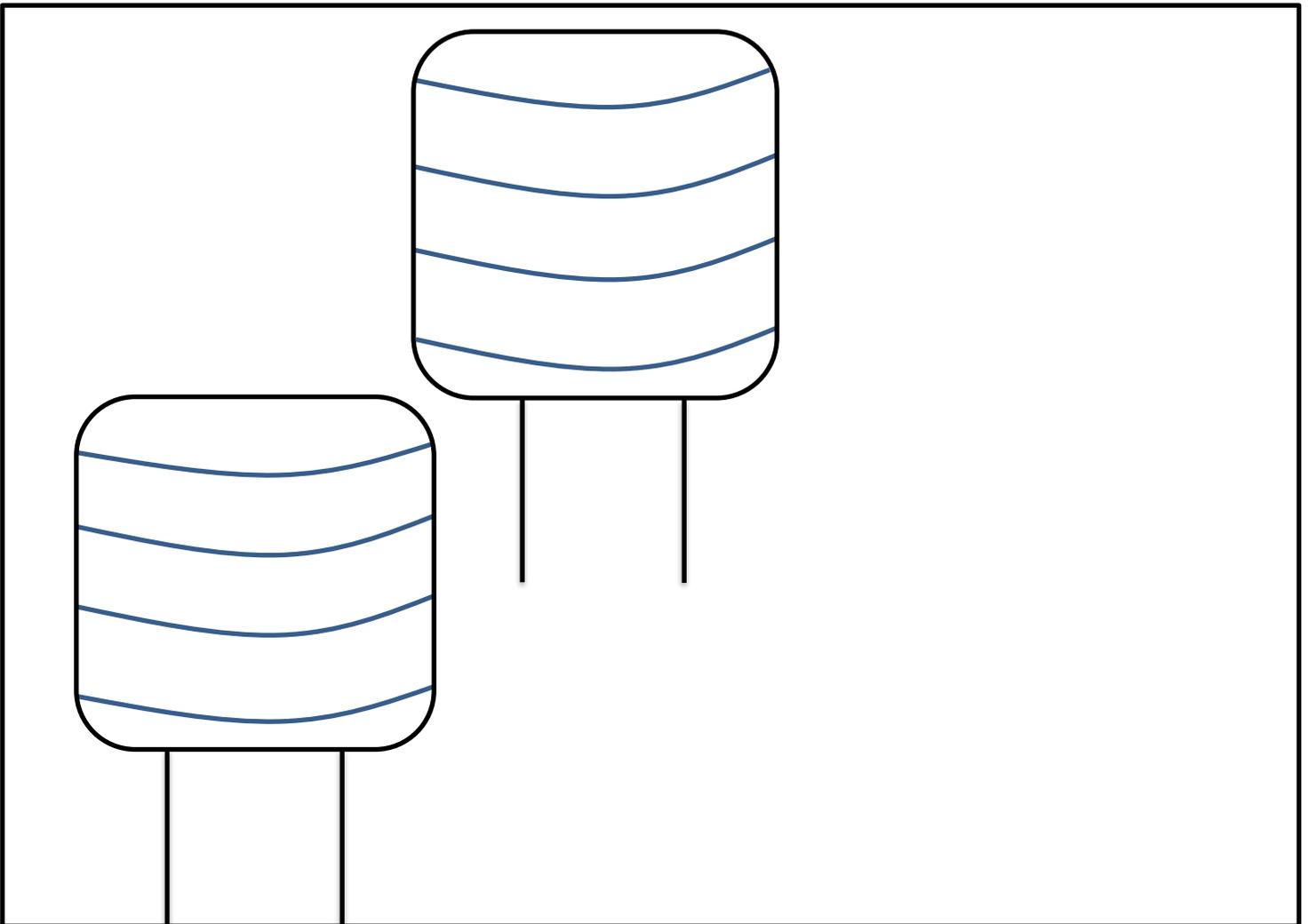
1. Climate change: _____
 2. Coral nursery: _____
 3. Coral reef: _____
 4. Endangered: _____
 5. Hermatypic coral: _____
 6. Macroalgae: _____
 7. Outplanting: _____
 8. Photosynthesis: _____
 9. Polyp: _____
 10. Reef health: _____
- a) process by which green plants convert carbon dioxide and water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



Student Activity Sheet

How Do Scientists Grow Coral? - Frame Cleaning

Today, you're the scientist! In the space below, create your own coral nursery! We have provided you with two coral frames to get started. Use the blank space to the right of the two coral frames to design your own structure for growing corals on in your nursery. A coral nursery is not complete without the coral! On the coral frames and your coral structure draw your staghorn coral (*Acropora cervicornis*). Make sure you leave space between each coral fragment, so they have room to grow. Organisms other than coral also live in and around coral nurseries. Just like a coral reef you can find many species of fish swimming around. Many of these fish species help the coral nursery by eating the macroalgae that grows on the frames. Draw some fish and other marine organisms in your coral nursery. Remember that even though the fish help clean some of the macroalgae, they don't eat it all. It is important that our scientists clean the nursery completely of macroalgae at least once a week so the corals can stay healthy and continue to grow! Good luck creating your own healthy coral nursery! We can't wait to see your creative designs!





Student Activity Sheet

How Do Scientists Grow Coral? - Frame Cleaning

Today, as a scientist, you have drawn and created your own great coral nursery. Now, you are going to create and build your own 3-D coral frame. Once you have created your frame you can draw your own coral and hang them on your 3-D structure. You can create multiple frames and form your own 3-D nursery!

For this activity you will need: 4 paper straws [or: wood sticks (x8), popsicle sticks (x8), skewer sticks (x8), pieces of paper(x8) toothpicks (x16)], tape, nylon thread [or: dental floss, yarn, string, twine].

First Step: Building the Frame

- You will need four straws. These will be the main structure of your frame. You can also decide to use an equal number of wooden sticks, popsicle sticks or skewer sticks. If you don't have any of these items, you can tape together toothpicks or simply roll pieces of paper and tape them.
- Lay the four sticks down to form a square. (If using toothpicks, lay four in a group to form each side. Tape the four of each side together.)
- Connect the four corners of the square with tape.
- Now you have your frame!

Second Step: Build the Lines

- Cut three pieces of nylon thread so they are slightly longer than the length of you frame. If you do not have nylon thread you can use dental floss, yarn, string, or twine.
- Lay your frame down and place the first piece of thread across the frame so it is slightly below the top stick.
- Tape the nylon thread to the two vertical sticks of your frame. You have made the first line of your frame! This line is what your corals will hang from.
- Tape the remaining two threads to your frame.
- *Make sure there is enough space between each thread for your corals to hang*

Third step: Hang the Corals

- On a blank sheet of paper, draw and colour nine corals.
- Cut out your coral drawings and tape them to the lines of your frame.
- You must keep a maximum number of three corals on each line, so the corals are not too crowded. It is important to leave enough space between the corals so they can continue to grow.

You can create multiple 3-D structures to form your own coral nursery! Use your creativity to create your own 3-D structures as well. Happy building!