



RADICAL REEFS



Watch the “Artificial Reef Dive Update” video on to learn about how artificial reefs can provide unique homes to a variety of ocean organisms.

<https://youtu.be/tmwZILLFChU>

For Instructors, parents, or guardians:

Lesson learning objectives: By the end of this lesson, students will be able to understand the difference between natural and artificial reefs, identify to marine life, and apply counting skills to species identification.

1. Introduce the topic:

This lesson will cover natural and artificial reefs in Florida and their benefits to species that live on them. It will also cover species of fish that are residents at CMA that can also be found on reefs as well as methods researchers use to study marine life on reefs. First have your student(s) watch the video. See how many different types of animals and plants they can count.

2. Reefs:

The Gulf of Mexico is home to several coral reefs. Coral reefs are underwater ecosystems made up of several types of corals that continue to grow, often on top of one another. Reefs often also have sponges and algae growing on them which provide a complex habitat for many types of marine animals. Coral reefs provide marine life more shelter, food, and resources than surrounding open ocean areas. Because of this, they have a high number, or abundance, of marine life and are very important to protect.



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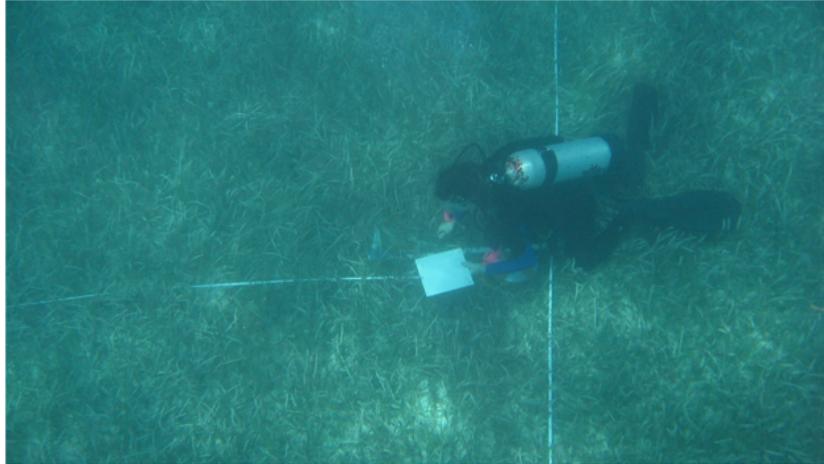
A man-made, or artificial, reef is a reef made out of some type of structure that will provide the same complex habitat that a coral reef can. Artificial reefs can be made out of sunken boats, pieces of concrete, and even sunken construction cranes. The goal of an artificial reef is to attract marine life to use it like they would a coral reef. Scientists hope that this will provide homes to more animals and help species grow bigger populations in the wild.

In this video, the artificial reef is made out of the houseboat from Dolphin Tale and Dolphin Tale 2. All parts of the boat that would not be safe to sink, like plastic, were removed from it. The base of the boat was then towed offshore and sunk in April of 2019. Just 8 months later, when this video was taken, there was tremendous growth on the boat and many marine animals appear to be using it as a home. How many animals were you able to count?

3. Reef Research Methods

When a research team sinks a new artificial reef, they often go back to the reef to monitor it. Each time they go back, they will look for the species, or types or organisms, using it. Their goal is to count the total number of organisms on the reef and count the total number of different species on the reef. Together, this is called biodiversity. **Biodiversity** is a word used to describe the variety of species in a given area. Depending on how big the reef is, counting could take a long time. Instead of counting everything across the whole reef, researchers will count a sample or a small section of the reef to represent the whole thing. There are two common sample types reef researchers will use.

Transect: This is a line from one part of the reef to another. Researchers will use string or measuring tape to create the line. Anything that touches the line is counted.



Quadrat: This is a square with nothing inside, kind of like a picture frame. The researchers will lay the square down on a random part of the reef and count everything inside of it.



*These methods of research are used a lot because the organisms inside the study area do not have to be removed or harmed.

4. Put your student(s) learning to the test:

On the following page, see if your student(s) can use their research skills to collect a quadrat sample.

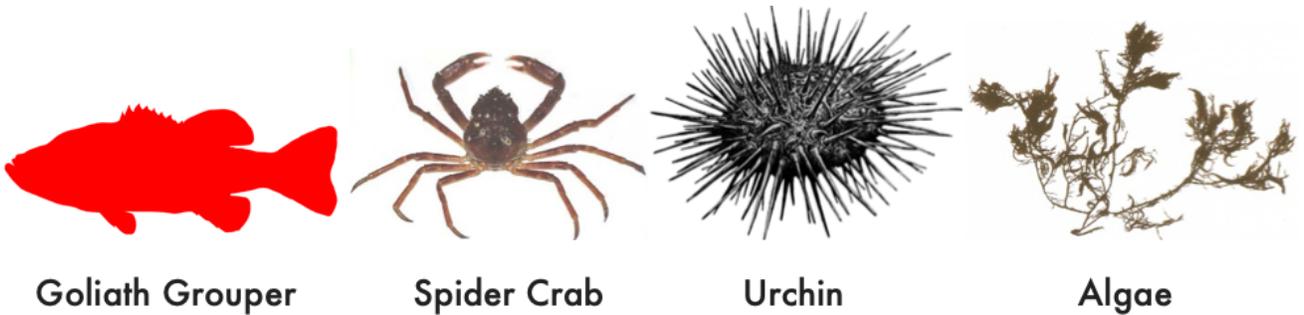


Be a Reef Researcher!



You are diving with your research team at one artificial reef and one natural reef. You are going to use a quadrat to compare the organisms found at each reef. In each quadrat, or square, count the number of species and the total number of animals.

Types of organisms:



Goliath Grouper

Spider Crab

Urchin

Algae

Quadrat 1: Artificial Reef



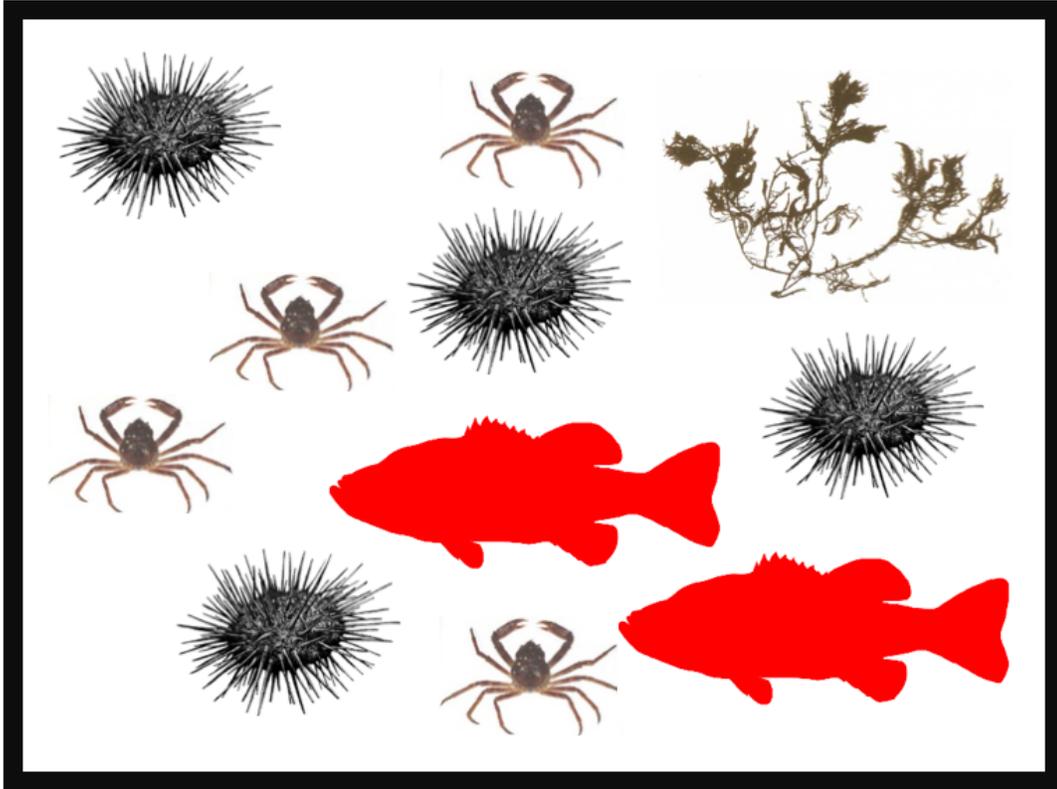
How many species, or different organisms, did you count: _____

How many total organisms did you count: _____

Be a Reef Researcher!



Quadrat 2: Natural Reef



How many species, or different organisms, did you count: _____

How many total organisms did you count: _____



For an Added Challenge:

At Home Science



Take a sample just like a reef researcher. In your backyard or closest outdoor space, make your own quadrat to sample the biodiversity of your local environment.

To make a quadrat you'll need:

- A 2-foot by 2-foot area of a yard or natural landscape
- String, twine, or 4 popsicle sticks or twigs
- Paper and pen or pencil

To make your quadrat. Create a square surrounding your 2-foot by 2-foot research area using either your string or twine or connecting your popsicle sticks or twigs.

Once you have your quadrat set up, observe the different types of plants or insects in your quadrat. Write each species down and count how many of each plant or animal you find in your quadrat. The more species in your quadrat the higher the biodiversity, which makes for a strong ecosystem. If you do not have an outdoor space, have another person set up random items scattered on the floor of your home. You can use different food items, books, or coins to represent different species.

