



Lesson 1: Underwater Cities - Design Your Own Coral Reef

Theme: Coral Biology

Grade Levels: K-2

Duration: 45 to 60 minutes

Students will learn about basic coral reef biology and construct their own coral reef models.

Next Generation Sunshine State Standards:

SC.K.L.14.3	Observe plants and animals, describe how they are alike and how they are different in the way they look and in the things they do.	SC.1.N.1.2	Using the five senses as tools, make careful observations, describe objects in terms of number, shape, texture, size, weight, color and motion, and compare an individual's observations with others.
SC.K.N.1.2	Make observations of the natural world and know that they are descriptors collected using the five senses.	MAFS.1.G.1.1	Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes that possess defining attributes.
SC.K.N.1.4	Observe and create a visual representation of an object that includes its major features.	SC.2.L.17.1	Compare and contrast the basic needs that all living things, including humans, have for survival.
MAFS.K.G.2.5	Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.	SC.2.N.1.1	Raise questions about the natural world, investigate them in teams through free exploration and systematic observations, and generate appropriate explanations based on those explorations.
SC.1.L.14.1	Make observations of living things and their environment using the five senses.		
SC.1.N.1.1	Raise questions about the natural world, investigate them in teams through free exploration, and generate appropriate explanations based on those explorations.		

OBJECTIVES

- Understand basic coral biology.
- Understand that a coral reef is made up a variety of living and nonliving things.
- Apply this knowledge to create their own coral reef structures in a variety of shapes, sizes, color and textures.

MATERIALS

- Lesson 1 PowerPoint.
- Coral models.
- Coral reef checklist (one per team) (put black and white pictures on back of sheet).
- Picture cards (one set per team).
- Modeling clay or art dough (one set per team).
- Tools (ice-pop stick, toothpick, tulle fabric, modeling clay tools).
- Reflection sheet.



VOCABULARY

ANIMAL:	a living thing that feeds on plants or other animals
CORAL:	an animal with stinging cells and tentacles, related to jellyfish and anemones, that has a limestone skeleton
CORAL REEF:	a living structure made of a variety of soft corals and stony corals that build limestone skeletons
ECOSYSTEM:	a combination of living and nonliving things

Lesson Procedure

Coral Biology

Use accompanying PowerPoint, coral models in the trunk and picture cards for visuals throughout the lesson.

Ask students if they know what a coral is (plant, animal, rock, etc.).

Many students do not know how to identify what a coral is. Corals look like either rocks or plants, but they are animals. Corals have stinging cells and tentacles like jellyfish, but they do not swim around. They are attached to the reef structure on the seafloor. There are soft corals that sway in the waves and stony corals that are rigid. The body of a coral is made up of polyps. Hundreds and even thousands of coral polyps connect to form the structures that create the shapes we recognize as corals on the reefs. (Show examples of corals in the trunk as well as picture/video resources in PowerPoint.)

Ask the students where corals can be found.

Corals can be found in oceans all around the world. Corals need just the right temperature, salinity (how much salt is in the water) and sunlight to thrive and grow. Most corals are found in the warm tropical waters around the equator. They can be found in many places ranging from shallow warm water where there are rocky bottoms to shipwrecks deep in the sea. Corals need a hard surface to settle on and grow. A coral reef is an ecosystem that provides habitats for many creatures in the ocean.



Photo by FWC Fish and Wildlife Research Institute

Ask students if they have ever seen coral before or can describe what they look like.

Corals come in a variety of shapes, sizes and colors. The soft corals move back and forth in the water, while the hard corals are rigid and stay in place. Coral colors include green, blue, purple, pink, gold and many colors in between. Some corals have branch-like shapes, like trees, while others can grow in mounds on the ocean floor. They can be tube-shaped, cylinder-shaped and sphere-shaped.

What kind of shapes, textures, sizes and colors do you notice in the corals?

Show students the slideshow photos and see if they recognize corals. Point out cylinders, circles, triangles, spheres, etc.; bumpy, rough, smooth textures; soft and hard corals; and the variety of colors.

If a coral is an animal, how does it eat?

Corals get food in two ways. Corals prefer to get energy from the sun with help from algae that live inside the coral's tissues. The algae photosynthesize, like other plants, to provide food for the coral. Another way the coral gets food is by eating plankton. Plankton are very tiny creatures that live in the ocean. Coral polyps have tentacles, like jellyfish, that help them catch the plankton to eat.

Ask students if they know what lives on a coral reef.

Thousands of plants and animals can live on a coral reef. Reefs are known as rainforests of the sea because they are home to so many creatures, such as sea turtles, sharks, sea stars, sand dollars, lobster, shrimp, and fish ranging from tiny gobies to goliath groupers and rays. (See accompanying pictures in PowerPoint or use books located in the trunk for many more examples of the animals that live on a coral reef.)

Ask students if people can live on a coral reef.

People can't breathe underwater like fish, but they can visit coral reefs by snorkeling or scuba diving. It's a beautiful site to observe!

Explain to students that coral reefs form a home that provides shelter and food to many different creatures in the sea.



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Prior to beginning this activity be sure to put the students in pairs.

Explain to the students that they will practice “engineering” corals. Engineering is when you design and build something. While they are building their corals today, remind them to focus on the shapes, colors, sizes and textures that they saw in the videos and pictures. Review those specific attributes in the slides on the PowerPoint.

Give students the coral reef checklist with examples of the special attributes discussed. Review the checklist with the whole group. Give the students a few minutes to review and decide with their partner which ones they would like to engineer. They can choose three to design. If they have more time, they can try some others.

Pass out the art dough to each pair and give them time to engineer their corals. Walk around the room to assist students with their designs.

Tell students to raise their hands when they are finished. When their engineering designs are complete, they may have a fish to add to their corals. (Fish will be laminated and attached to a ice-pop stick to add to the coral reef creations.)

Take photos if possible. We would love to see and share their creations!

If time allows, students may draw their designs on the reflection sheet.

Lesson Wrapup

Give students time to pair up with another team, and talk to the group about the following reflection questions:

1. What shapes did you use to engineer your corals today?
2. What textures were on your corals?
3. What colors were your corals?
4. What do corals eat?
5. What kind of animals live on a coral reef?



Photo by FWC Fish and Wildlife Research Institute