Grade Level: K-2
Time Estimate: 2 days

OCEAN HABITATS / INSTRUCTOR INFO

Summary

This lesson includes vocabulary, content, examples, and activities to help students learn about the world ocean and the types of habitats found there. Considering the type of habitat, students will learn about the adaptations animals have in order to survive in their environment. To conclude, students will learn about the men and women who made careers out of studying the world ocean and its inhabitants.

Part 1. Introduction
Part 2. Ocean Habitats
Part 3. Ocean Careers
Part 4. Activity 1. I'm a Marine Biologist
Part 5. Activity 2. Ocean Animals

Goals & Objectives

The students will:

- Define the term habitat;
- Discuss adaptations and learn how they help animals survive in different ocean habitats;
- Learn the different types of habitats found in the world ocean;
- And describe the jobs of a marine biologist and oceanographer.

// STANDARDS

STEM

This lesson plan aims to assist teachers in implementing a STEM-based program into their classroom while inspiring the next generation of explorers, scientists, and stewards of the ocean. Based on real science and the Global Shark Tracker™, "Introduction to Cardinal Directions" is intended to promote environmental awareness and to prepare students for STEM careers.

This lesson aligns with the following TEKS:
Kindergarten Science: 2A, 2D, 2E, 3C
Kindergarten Social Studies: 15A, 15B, 15C, 15D, 16A, 16B
Grade 1 Science: 2A, 2D, 2E, 3C, 6A, 7B, 10A
Grade 1 Social Studies: 17A, 17B, 17C, 17D, 18A, 18B
Grade 2 Science: 2A, 2D, 2E, 2F, 3C
Grade 2 Social Studies: 17A, 17B, 17C, 17D, 18A, 18B

This lesson aligns with the following Maryland Standards:
2.2.a-e, 3.1.a-e, 6.b.1.a-c

This lesson aligns with the following Indiana Standards:
1.3.1, 1.3.4, 1.3.5, 1.4.2, 1.4.3

Helpful Tips

1. The content in this lesson is based on the conservation work of OCEARCH™ and the Global Shark Tracker™. Spend a few minutes getting familiar with the website and the tracker if you have not done so already. The Global Shark Tracker™ is also avail-able as an app for iPhone and android.

2. This lesson plan is designed to be adaptable to suit your specific needs. Use the en-tire lesson plan or just parts of it. This material can be expanded to be an entire unit or condensed for just one day in the classroom.

3. Vocabulary words will be underlined as they first appear in the lesson plan. A complete list of vocabulary words is included as well.

4. Answers to questions and prompts for discussions will appear in italics.

5. Optional activities and content (side notes) will appear in a box. Use these to enhance your lesson and adapt it to suit your needs!

6. Have questions for M/V OCEARCH Expedition Leader, Chris Fischer? Email in-fo@OCEARCH.org to schedule a Skype session and let your students/child talk directly to Chris and the M/V OCEARCH crew!

7. Email all questions about this lesson to info@OCEARCH.org.

Vocabulary

Adaptation: A trait that helps a plant or animal survive in its habitat.

Environment: One's surroundings.

Habitat: The natural home or environment of an animal, plant, or other organism.

Ocean: A very large body of salt water that is divided by continents, known as the Atlantic, Pacific, Indian, Arctic, and Southern oceans.

Marine Biologist: A scientist who studies plants and animals that live in or depend on the ocean.

Oceanographer: A scientist who studies the oceans' depth, physical structures, marine biology, and chemistry.

Grade Level: K-2

OCEAN HABITATS / LESSON PLAN

PART 1. INTRODUCTION **20 mins**

Ask the students what they already know about habitats. Can they name different types of habitats?

A **habitat** is the natural home or **environment** of an animal, plant, or other organism. There are many types of habitats, each of them unique and home to a variety of plants and animals.

What type of habitat does a tiger live in? ***Answer:*** *Jungle*
What type of habitat does a bear live in? ***Answer:*** *Forest*
What type of habitat does a giraffe live in? ***Answer:*** *Savanna*
What type of habitat does an alligator live in? ***Answer:*** *Swamp*
What type of habitat does a shark live in? ***Answer:*** *Ocean*

Today, we are going to learn all about ocean habitats! An ocean is a very large body of salt water, in contrast to smaller, freshwater lakes and ponds. Oceans cover 71% of the planet! There is one world ocean, divided into five regions. Point to each ocean on a map for the students to see. Be sure to point out that all five oceans are connected, which is why scientists now refer to the oceans as the "world ocean".

1. Pacific Ocean
2. Atlantic Ocean
3. Indian Ocean
4. Southern Ocean
5. Arctic Ocean

Why is the Ocean Blue?

The ocean's color is determined by the sun! Sunlight is made up of all the colors of the rainbow: red, orange, yellow, green, blue, and violet. When rays of sunlight reach the ocean, the water absorbs all the colors in the red part of the light spectrum. Like a filter, this leaves just the blue part of the light spectrum Instead of absorbing these colors, the water reflects them giving the ocean is blue hue!

However, not all ocean water appears blue. Depending on particles floating in the water, the ocean will reflect other colors such as green. The Red Sea gets its red color from all the algae that live there!

The ocean is home to many different plants and animals, most of which live less than 300 feet deep. *Ask the students if they know why? Answer: Because this is as far deep that sunlight can reach. Very few animals can survive without sunlight.* Each ocean plant and animal is adapted to live in a particular ocean habitat. An **adaptation** is a trait that helps a plant or animal survive in its habitat.

What sort of adaptations do fish have to live in the ocean? They have gills to be able to breathe under water. They have fins to be able to swim. Some fish may have bright colors to blend in with coral reefs in order to hide from predators. And other fish may be able to swim very fast in order to catch their prey. Each animal is uniquely adapted to survive where they live. Let's discuss the different types of ocean habitats and the animals that live there.

PART 2. OCEAN HABITATS **30 mins**

Tide Pools
A tide pool is found near the beach where at low tide, ocean water gets trapped in a rocky hole or crevice. This leaves behind the perfect home for small marine animals such as snails, sea stars, sea anemones, crabs, and barnacles. These animals are adapted to withstand extreme environmental conditions. For example, because tide pools are so small and shallow, they are easily affected by rainwater, changes in temperature, and evaporation.

Coral Reefs
Coral reefs are shallow ocean habitats found close to the shore. The colorful coral that makes up a coral reef are actually made up of very tiny animals called polyps. Coral reefs are teeming with life! Did you know that 30% of all marine fish species are connected to coral reefs in some way? They live in, eat at, or visit a coral reef at some point in their lives. These animals include coral, vibrantly colored fish, eels, sea stars, crabs, octopuses, sea anemones, stingrays, and even sharks!

Is Coral a Plant or an Animal?

Coral is made up of tiny polyps. A polyp is a marine invertebrate, meaning that it lives in saltwater and has no backbone. Polyps are typically shaped like a sack and have a hard exoskeleton, kind of like insects. This is called the "cup." This hard exoskeleton cup is made from the minerals that the polyp collects from the nutrient-rich saltwater that it lives in. The bottom of the polyp is flat, so it can attach itself to a sturdy rock or even another polyp. The top of the polyp is the mouth and is surrounded by tentacles. Since polyps cannot move, the ocean's waves bring food and nutrients to the polyps, which use their tentacles to "catch" their food, then eat it.

Coral polyps clump together, and over a long time they create large, connected colonies called reefs.

There are two different types of coral – hard and soft. Hard corals are called reef builders because their cups stay hard, even after they die. Soft corals are flexible and their cups dissolve in the water when they die. Both types of coral can be very colorful, however coral is actually translucent, which means you can see through them. The color you see comes from algae that live on the coral.

Open Ocean
When most people think of the ocean they think of open water. It is very spacious and is where you can find the larger marine animals. Animals that live in open water are usually much bigger than those living closer to shore and can usually be found closer to the surface where there is more sunlight. Animals found in the open ocean include sharks, jellyfish, whales, tuna, marlin, sunfish, and dolphins.

Deep Ocean
Much of the ocean is completely dark since sunlight can only reach about 300 feet. Did you know that the deepest part of the ocean (the Mariana Trench, located in the Pacific Ocean) is 35,994 feet deep? The highest peak on Mount Everest, the tallest mountain in the world, is only 29,029 feet tall in comparison! The animals that live in the deep ocean are adapted to life in near darkness and cold water. Most animals here are small, have large eyes and are either darkly colored or completely colorless. These animals include squid, anglerfish, crabs, giant tubeworms, flashlight fish, and viperfish.

PART 3. OCEAN CAREERS **20 mins**

Those who have a love for the ocean have made it their job to learn as much as they can about the ocean and then share their knowledge with the world.

A **marine biologist** is a scientist who studies plants and animals that live in the ocean. They are interested in how animals survive in their environment, what they eat, how they protect themselves, how they reproduce, and how they are affected by changes to their environment such as pollution, temperature, and disease.

An **oceanographer** is a scientist who studies the world ocean's geology, waves, marine life, and chemistry. They are typically more interested in the ocean itself, the water and its amazing properties.

Scientists study the ocean and its inhabitants in many different ways. They can SCUBA dive, snorkel, observe animals from a boat, conduct experiments, operate small submersible vessels, collect specimens, and much more! OCEARCH researchers tag sharks and then track their swimming patterns in order to better understand the sharks' life histories.

Let's meet some well-known marine biologists and oceanographers!

Sylvia Earle
Sylvia Earle is a marine biologist who specializes in the study of plants. During 50 underwater expeditions and over 6,000 hours underwater, Earle has discovered many new marine species and set many diving records. In 1970, Earle led a team of five other explorers who lived for two weeks in an underwater laboratory!

Jacques Cousteau
Jacques Cousteau was a French ocean explorer. Cousteau traveled the world's oceans in his research vessel "Calypso," studying the sea and inspiring people around the globe to be environmental stewards of the ocean. In 1943, he invented the aqualung, a breathing apparatus that supplied oxygen to divers and allowed them to stay underwater for several hours.

Eugenie Clark
Eugenie Clark, sometimes referred to as The Shark Lady, was an American marine biologist known for her research on poisonous fish and on the behavior of sharks. Clark discovered the first effective shark repellent in secretions from a flatfish called Moses sole that lives in the Red Sea. She ventured into undersea caverns off Mexico's Yucatán Peninsula to find

"sleeping sharks" suspended in the water, a discovery that upended scientists' belief that sharks had to keep moving to breathe. She was also a pioneer in the field of SCUBA diving for research purposes. Did you know, one of OCEARH's sharks is named "Genie" in honor of Eugenie Clark?

PART 4. ACTIVITY 1. I'M A MARINE BIOLOGIST **1 hour; take-home**

Introduction

Students will use their library research skills to study a marine animal of their choice. Students will use the provided worksheet to learn everything they can about their animal.

Materials

- Worksheet (provided)
- Pencil
- Colored pencils, crayons, or markers
- Art paper, construction paper, or poster board

Instructions

1. Give each student a worksheet.

2. Ask students to think about what they have learned about ocean habitats and the animals that live there.

3. Students will select one ocean animal to do their project on. Selections can be done as a class so that choices do not overlap. However, this is not required since two students with the same animal might have different discoveries!

4. Students should be given time to research their animal in the library, using books and/or the internet. Research may also be done at home with the help of a parent.

5. Once the worksheet is completed, students should present their findings to the class. If you have more time, students can create a visual representation of their findings such as a poster or model.

6. Collect their worksheets to assess their understanding and display their presentations in the classroom for all to see.

Ocean Habitats Activity: I'm a Marine Biologist!

Name: _____

Date: _____

Pretend you are a marine biologist who studies animals that live in the ocean. Using library resources, research one marine animal of your choice and complete the rest of this worksheet. Then, be prepared to present your findings to the class!

1. The animal I have chosen to study is: _____
2. What habitat can this animal be found in? _____
3. As a marine biologist, how will you study this animal? _____

   _____

   _____
4. What type of food does this animal eat? _____
5. How does this animal get its food? _____
6. How does this animal protect itself from predators? _____

   _____
7. Name one unique characteristic this animal has. _____
8. Draw a detailed picture of the animal in the space below.

PART 5. ACTIVITY 2. OCEAN ANIMALS **30 mins**

Introduction

Students will get familiar with the variety of animals that live in and around the ocean. Students will also practice their cutting, arranging, gluing, and coloring skills.

Materials

- Worksheet (provided)
- Colored pencils, crayons, or markers

Instructions

1. Give each student a worksheet and a page of ocean animals.
2. Ask the students to carefully examine the ocean scene as well as the animals provided.
3. Students will cut out each animal, either along the outline of the animal or just a circle/box around the animal.
4. Before gluing, the students should arrange the animals in the ocean scene where they belong.
5. Glue the animals down.
6. Finish the ocean scene by adding colors and even more animals, people, and objects!
7. Collect their worksheets to display in the classroom for all to see or ask students to take the worksheets home to show off to their family. Be sure to encourage the students to tell their family everything they learned about ocean habitats!

Ocean Habitats Activity: Ocean Animals

Name: _____

Date: _____

Cut out the provided ocean animals and add them to the ocean scene!