

Pre-K Ocean Voyage Group Exploration

Lesson 3: Ocean Zones

Our big blue ocean is home to all types of living things, but it might be surprising to hear that it is not entirely blue! In fact, only about 25% of our ocean sees the sunlight that makes it blue. The areas that receive sunlight are the top two zones: the sunlight zone and the twilight zone. As you travel deeper into the ocean it becomes darker and darker until you reach the midnight zone, where there is no sunlight. In this lesson, students will make observations of different animals that live in these three ocean zones and practice matching animals to the zones they call home.

Goals, Objectives, and Outcomes

Goal:

Students will gain confidence and begin to develop science identity.

Learning Objectives:

In this lesson, students will:

- Identify the three ocean zones.
- Make observations and describe the features of animals in different ocean zones.
- Match and group animals by the ocean zones in which they live.

Student Outcomes:

After participating in this lesson, students will be better able to:

- Compare and contrast different ocean zones.
- Infer how an animal's body features help them to live in different ocean zones.

Standards

OSSE DC Early Learning Standards:

19. Investigates living things.

Indicators:

- 19a. Compares, using descriptions and drawings, the external body parts of animals (including humans) and plants and explains functions of some of the observable body parts.
- 19c. Observes familiar plants and animals (including humans) and describes what they need to survive.

14. Matches, groups, and classifies objects.

Indicators:

- 14a. Groups objects according to a common characteristic, regroups them according to a different characteristic and explains the grouping rules.

Lesson Preparation

Materials

- Books about ocean zones
- Images of ocean life found in each ocean zone (attached)
- Physical space or area to display Ocean Zone Diagram (see below)
- Ocean Zone Diagram
 - » Black, dark blue, and light blue sections to represent the 3 ocean zones (see image). Suggested materials include: colored paper, felt, cloth, towels, blankets, etc.
 - » Yellow ball or circle to represent the sun

Set-up

1. Prepare animals for sorting portion of the activity. To do this, cut out the printed ocean zone animals. Each image is placed on a specific background color corresponding to one of the 3 ocean zones discussed in this lesson. The 3 zones this lesson teaches, and the corresponding colors, are:
 - a. Sunlight zone - light blue
 - b. Twilight zone - dark blue
 - c. Midnight zone - black

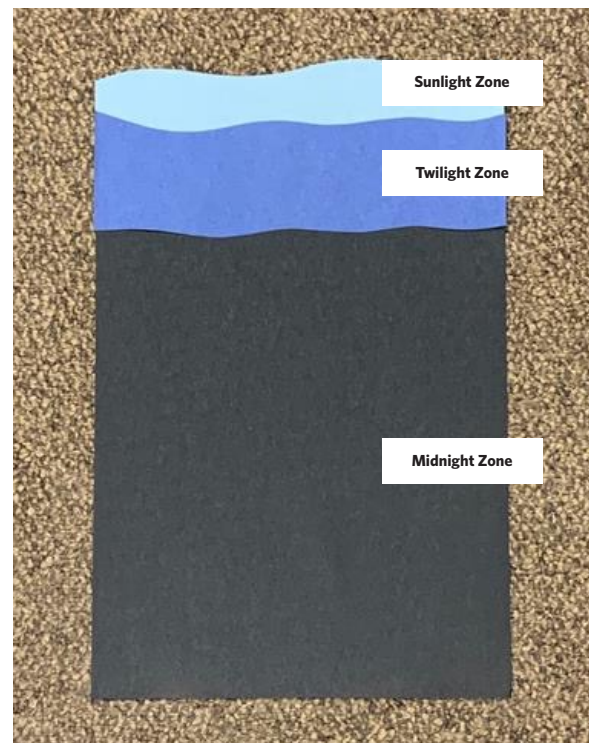


Image Caption: Ocean Zone Diagram made from paper (labels included in image for reference only)

2. Laminate the photographs of animals (optional).
3. Create the Ocean Zone Diagram where your students will place the animals. Suggested methods for setting up the diagram include: placing it on the wall or bulletin board, or sectioning off a blanket with string. The sunlight zone should be the smallest area, the twilight zone be slightly larger, and the midnight zone should take up most of the diagram.
4. Place a yellow circle or ball above the Ocean Zone Diagram. The circle that represents the sun should go at the top of the diagram, above the sunlight zone.

See the Educator Resources for this lesson to get more information on different zones and depths.

Lesson Facilitation

1. **Hook:** Invite students to use their imaginations to prepare for a dive together into the deep sea.
 - a. Say: ***Hello divers, are you ready for a dive into the deep sea? What are some things we need to bring with us on our adventure?*** [take responses] ***Okay, let's put on our ___ [flippers, goggles, oxygen tank, boat, submarine] ___! What else do we need?*** [Repeat until students are ready for their ocean voyage].
2. **Introduction:** Orient students to the Ocean Zone Diagram, imagining that the blue and black colors represent the ocean and that the yellow circle represents the sun. Then ask students to make observations about what they see and notice.
 - a. Say: ***Welcome to the three zones of the ocean, deep sea divers! Together we are going to make a diagram of the ocean with different ocean animals! We will use this space for our diagram. I have put out some colors and material for us to use. The blue and black colors are the ocean, and the yellow is the sun. What do you notice about this diagram?*** [Different colors, different sizes, the black space is the largest].
3. **Ocean Zones Introduction:** Share with the students about the different colors and spaces.
 - a. Say: ***“Excellent observations of our ocean space! Here we see two different blues, one lighter and one darker, and a very large area that is all black. Each color represents a different zone in the ocean! Many plants and animals live in the ocean, and different plants and animals are found in each of the ocean zones!”***

b. Sunlight Zone

- i. Say: ***“Light blue is for the ocean zone called the sunlight zone. And here above it is our Sun. The Sun shines down into the ocean, but the light doesn’t go all the way down to the bottom. The area of the ocean that has the most sunlight is called the sunlight zone, closest to the top or the surface of the ocean.”***



Image Caption: Student sharing observations of different zones in the diagram.

c. Twilight Zone:

- i. Say: ***“As we swim deeper on our ocean dive, the next zone down is the dark blue part of our diagram. Dark blue is for the ocean zone called the twilight zone. This zone in the ocean only gets a little bit of light from the sun and is darker than the sunlight zone.”***

d. Midnight Zone:

- i. Say: ***“The final ocean zone is the black space on our diagram! This is called the midnight zone. You might notice the black area, or midnight zone, is bigger than the light blue AND dark blue areas. That’s because it’s deeper than the other two zones. In fact, it is the largest AND deepest ocean zone! We are using the color black for this zone because the water in this part of the ocean is VERY dark. There is no sunlight here! The midnight zone is home to MANY different creatures. Some of the creatures even create their own form of light!”***

4. **Read aloud:** Invite the students to take a dive into the ocean zones through a teacher-chosen book about ocean zones. If you do not have a book available, lead the students through the different zones using images and observations.

- a. Say: ***“Now that we know the ocean has different zones, let’s see what types of animals and plants live in each of the zones!”***

- i. Potential guiding questions to ask about animals in the book or in an image:

A. ***This animal lives in the ___ zone. What body features do you see?***

- B. **How do you think having [body feature] might help the animal live in the zone?**
- C. **This animal has [insert body feature]. It helps the animal to [insert function*] in the zone.**

4. Specifically for some twilight and midnight zone animals:
Some animals emit or shine their own light. This is called bioluminescence. Bioluminescence can help the animal scare away predators, attract or find food, or to communicate with other animals like them, or to blend in with their environment.

5. **Review:** After the book or the image exploration of ocean zones has finished, review the Ocean Zone Diagram. Remind students of the 3 zones (sunlight, twilight, midnight) and that each zone is home to many different animals.

- a. Say: ***“There are so many different animals that live in the ocean! We just saw a few of these animals, but they do not all live in the same place in the ocean. Let’s look back at our diagram. Some animals live in the sunlight zone, others are found in the twilight zone, and some animals live in the deepest and darkest part of the ocean: the midnight zone. Each zone is home to many different animals.”***

6. **Model Matching and Grouping Activity:** Model placing the animals in the zone based on the clue given by the border color of the image.

- a. Say: ***“We have a challenge for you, deep sea divers! Let’s find out which ocean zones all of these animals live in! Animals can find what they need to live and stay safe in their ocean zone. There is a color around each animal to help us make sure we match the animal to the correct zone. I will start.”***

- b. Model using the hydromedusa, which can be found in the midnight zone animal images attached to this lesson. Say: ***“Here is an animal called a hydromedusa. I see that it has a round part and lots of long string like body parts. I also see that it is kind of glowing white or blue and a large part of it is glowing RED! I also notice that it has black around the image. That is our clue to know where this animal lives. What zone of***



Image Caption: Student matching their animal to the correct ocean zone.

the ocean do we think I should put it in? [take responses] That's right! This animal belongs in the midnight zone, and so I should put it here in the black area. Remember when we noticed that this animal glows red? Some animals in the darkest parts of the ocean have light that can come from their body. This is called bioluminescence. Some animals use their bioluminescence to hide from other animals, to find food, or to communicate with others. Red is a sneaky color that is hard to see in the darkest parts of the ocean. The hydromedusa, one of the animals we have here as an example, uses its red color to hide and stay safe from other animals that might want to eat it.



Image Caption: *Felt ocean zones diagram with laminated sun showing sorted animal photographs.*

7. **Student Animal Matching:** Pass out different animals to the students for them to sort into the different zones of the ocean. Allow students, one at a time, to place their animal in the zone they think is correct based on the color hint. Students can also share observations that they have of the animal or the teacher can share information about each animal. Note: The name of and information about each animal can be found after the image resources in a picture index, including the hydromedusa from above.
 - a. Potential guiding questions:
 - i. ***Have you ever seen this animal before?***
 - ii. ***What do you notice about your animal?***
 - iii. ***Which zone do you think your animal belongs in?***
8. **Summary:** Wrap up the lesson with a summary.
 - a. Say: ***“Today we learned all about the different zones of the ocean and some of the animals that live in those zones. We learned that some animals can do some really cool things with their bodies that help keep them safe or find food, like shine their own light! We also practiced using clues and observations to help group our animals into their correct ocean zones. Great job, divers!”***

Images: Lesson 3, Ocean Zones

Instructions:

Print and cut pages 8–12 to use when doing the matching activity in the Ocean Zones lesson. (Lamination is optional.)

Pages 13–17 contain indices of the images in the lesson. Each of the indices have information to share with the students about each animal.

Table of Contents:

- Pages 8–9: Animals for **sunlight zone**
- Page 10: Animals for **twilight zone**
- Pages 11–12: Animals for **midnight zone**
- Pages 13–14: Sunlight Zone Animal Image Index
- Pages 15: Twilight Zone Animal Image Index
- Pages 16–17: Midnight Zone Animal Image Index

Mola mola



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Image credit: National Oceanic and Atmospheric Administration (NOAA)

Jellyfish



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Image credit: National Oceanic and Atmospheric Administration (NOAA)

Clymene dolphins



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Image credit: National Oceanic and Atmospheric Administration (NOAA)

Cabbage Coral



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Image credit: National Oceanic and Atmospheric Administration (NOAA)

Hawkbill Sea Turtle

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Image credit: National Oceanic and Atmospheric Administration (NOAA)



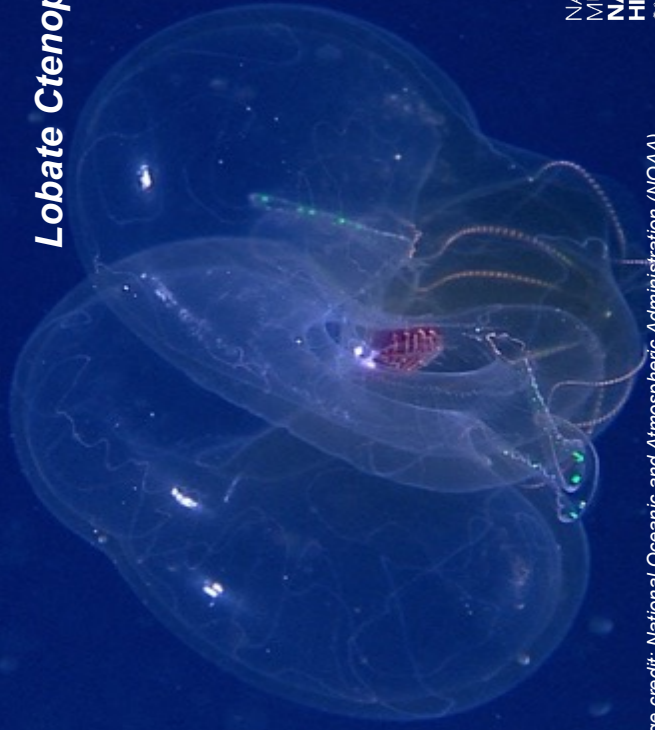
Scalloped Hammerhead Shark and Anthias

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Image credit: National Oceanic and Atmospheric Administration (NOAA)



Lobate Ctenophore



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Image credit: National Oceanic and Atmospheric Administration (NOAA)

Lionfish



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Image credit: National Oceanic and Atmospheric Administration (NOAA)

Siphonophore

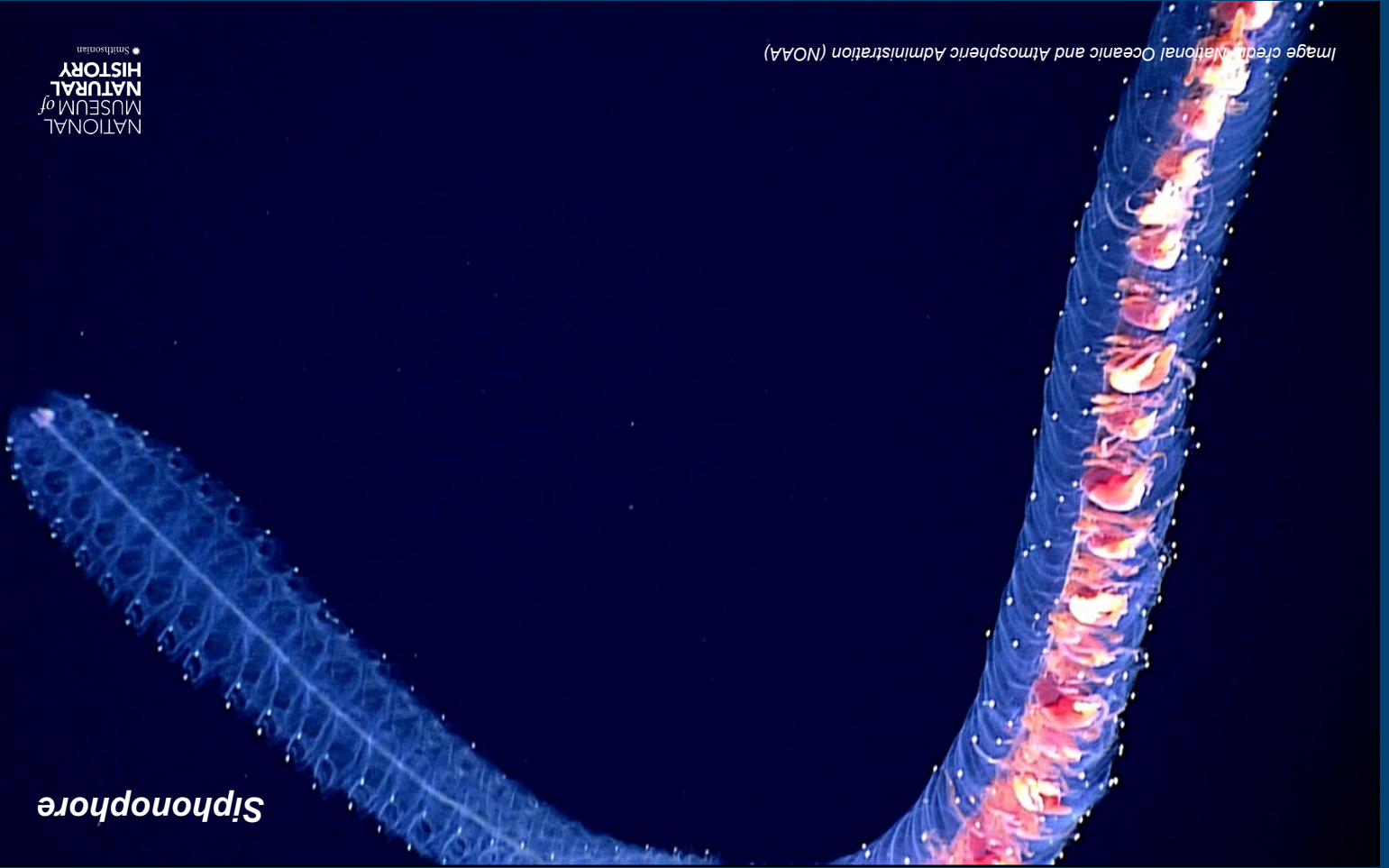


Image credit: National Oceanic and Atmospheric Administration (NOAA)

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Shortnose Greeneye Fish



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Goosefish



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Sea Cucumber



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Riftia Tube Worm



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Sargassum Shrimp



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Sea Cucumber

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Vampire Squid



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Hydromedusa

Image credit: National Oceanic and Atmospheric Administration (NOAA)

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Sunlight Zone Animal Image Index, page 1 of 2



This is a type of coral called a **cabbage coral**. Their edges look leafy, which help to give it its name. They can grow to be up to 24 inches. They can be found in the Red Sea and the Indo-Pacific.



These are **clymene dolphins**. These dolphins can be found in the sunlight zone, the twilight zone, and the midnight zone. They are known for spinning when they jump out of the water.



This is a **hawksbill sea turtle**. They are known for their narrow and pointy beak (mouth).



This **jellyfish** has an umbrella-shaped top with long flowing tentacles. Even though jellyfish have “fish” in their name, they are not actually fish. They are a type of invertebrate, or an animal with no backbone.



This is a ***Mola mola***, or an **ocean sunfish**. This fish is known for being very large and flat with a tiny mouth. The *Mola mola* can be up to 5,000 pounds in weight!

Mola molas like to go with the flow! They are not the best swimmers, but they can float to different places around the world using currents.

Sunlight Zone Animal Image Index, page 2 of 2



This is a **scalloped hammerhead shark**. They are known for their “hammer-shaped” head. By having their eyes placed so far apart, hammerhead sharks have a wide field of vision. They are a large shark that can weigh up to 335 pounds and be up to 11 feet long!

This shark is swimming amongst schools of **anthias** in and around a coral reef.

Twilight Zone Animal Image Index, page 1 of 1



This is a **lionfish**. Lionfish can live in the sunlight or the twilight zones of the ocean. They have 13 long spines along their body that can sting. The spines help the lionfish to stay safe from predators.



This is a **lobate ctenophore** (LOW-bait TEEN-o-for), also known as a comb jelly. Comb jellies get their name from the little bristles found on their bodies. Many animals in the twilight zone and the deep sea/midnight zone, including this comb jelly, use bioluminescence to attract prey or to protect themselves. Bioluminescence is when an animal can emit light from their body.



This is a **siphonophore** (sigh-FAW-nuh-for). A siphonophore is made up of many tinier animals called nectophores that make up a colony. A single nectophore starts the colony by budding and producing more identical nectophores. Siphonophores use bioluminescence to attract small fish or prey and to blend in and hide from predators.

One nectophore is about the size of a pea, but when they all chain together they can be over 100 feet long. That's longer than the largest animal on Earth, the blue whale!

Midnight Zone Animal Image Index, page 1 of 2



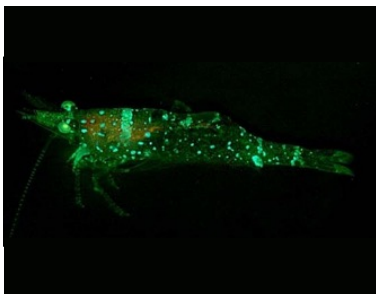
This is a **goosefish** (also known as a monkfish), a species of anglerfish. The goosefish uses a lure that looks like a fishing pole coming out of the top of its head. Using this lure, the goosefish attracts prey to swim close, and the goosefish eats them!



This is a **hydromedusa**. They are clear and red in color to help hide from their predators. Red is a hard color to see when you're underwater, so their predators cannot see them at all.



This is a **riftia tube worm** colony. The red part of their bodies are their gills, which help them breathe! These tube worms anchor themselves into the ground so they can stay securely in their spot.



This is a **sargassum shrimp**. Shrimp in the midnight zone might use their bioluminescence to help them find food or to confuse predators! Many animals in the midnight zone are bioluminescent, meaning they can emit light from their body.



This is a **sea cucumber**. Sea cucumbers get their name because the shape of their body is like a cucumber. Some sea cucumbers walk along the ocean floor using little tube-like tentacles, and some can swim! This sea cucumber is swimming.

Midnight Zone Animal Image Index, page 2 of 2



This is another swimming **sea cucumber**.

Fun Fact: Sea cucumbers have a very unique way to trick or confuse predators. When sea cucumbers are scared and want to trick predators, they will push their sticky digestive system outside of their bodies for the predators to eat. The predators eat the digestive system and are distracted so the sea cucumber can escape. Afterwards, the sea cucumber will regrow its digestive system over the next couple of weeks!



This is a **shortnose greeneye fish**. Scientists think their eyes glow green to see better in the dark water. Many animals in the midnight zone are bioluminescent, meaning they can emit light from their body.



This is a **vampire squid**. Vampire squids have photophores, or light-producing organs, all over their body. They can use this light they produce (bioluminescence) to help them avoid predators.

Fun fact: Squid's brains are in the shape of a donut/bagel.