

## Creatures of the Deep

### Elaborate

Grade: Kindergarten	Implementation Practice: Individual or Pairs
Subject Area: Science	Supporting Content: Engineering
Objective(s): Students will plan and design their own ocean creature equipped with the adaptations needed to survive in the ocean.	

#### Standards Addressed

<b>NGSS</b>	Performance Expectation K-ESS3-1: Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live		
	Disciplinary Core Idea(s)	Science and Engineering Practices	Crosscutting Concept(s)
	<ul style="list-style-type: none"> <li>• ESS3.A: Natural Resources</li> <li>• ETS1.A: Defining and Delimiting an Engineering Problem</li> <li>• ETS1.B: Developing Possible Solutions</li> </ul>	<ul style="list-style-type: none"> <li>• Asking Questions and Defining Problems</li> <li>• Developing and Using Models</li> </ul>	<ul style="list-style-type: none"> <li>• Systems and System Models</li> </ul>
	Engineering, Technology, and Application K-2-ETS1-2. Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.		
<b>CCSS</b>	ELA-Literacy  SL.K.5 Add drawings or other visual displays to descriptions as desired to provide additional detail	Math  K.CC Counting and Cardinality	

#### Vocabulary and Skills

Key Terms			Key Skills
animal	coral	coral reef	observation
habitat	sea snake	characteristics	modeling
ocean	salt water	fish	

Essential Question(s):

How are animals that live in the ocean different from animals that live on land?

Guiding Question(s):

What characteristics (adaptations/attributes) are required for life in the ocean?

How do animals in the ocean move around?

How do ocean animals get the air they need?

How do animals that live in the ocean get food?

Where do animals in the ocean sleep and hide?

## Teacher Background Information

### 5E Instructional Model – Elaborate

The 5E instructional model organizes learning experiences so that students have the opportunity to develop their own understanding of the concept over time by building what they know. There are five phases of learning including: Engage, Explore, Explain, Elaborate, and Evaluate. In the Elaborate portion, students are expected have conceptual understanding of the concepts and should be ready to apply and extend what they know.

During the Elaborate phase, students are asked to draw on their prior learning experiences to understand and explain new concepts and create conceptual connections between new and previous experiences. Students should be able to describe in their own words (illustrations, models, etc.) what they have learned about a new idea, object, event, or organism and apply that understanding to new situations. The teacher's role is to focus students' attention on those conceptual connections and encourage the use of new terms and descriptions. Additionally, the teacher should be asking questions that help the students to draw their own conclusions based on evidence and data.

As the lesson is introduced, be sure to reiterate to the students that this is an opportunity for them to apply what they know. Encourage students to use new terminology and apply new concepts as they work through the activities.

### Content Background – Characteristics and Needs of Animals

All living things, including animals, have four basic needs: air, water, food, and shelter. Animals, marine and terrestrial, acquire their needs in a variety of ways. Marine organisms, specifically fish, are unique in that they use gills to obtain oxygen (air). It is important to note that dissolved oxygen is naturally found in both fresh and saltwater. The gills of fish are specialized organs used to absorb the dissolved oxygen from the water into their bloodstream, similar to how our lungs transfer oxygen to our blood.

Animals also display a set of characteristics shared by all living things. Animals are: made up of body parts, able to grow and develop, able to respond to their environment, able to reproduce, and able to break down food for energy. Animals living in the ocean have the same set of characteristics, they are just different, and more suited for live in the water.

For example: Fish have fins instead of arms and a tail instead of legs. They do not have lungs; they have gills. Fish are covered in scales rather than fur, feathers, or skin. Some fish lay eggs, while other fish give birth to live young. However, all fish still have the same four basic needs of all living things and share the same characteristics as other animals.

While the 360° video is dominated by reef fish, hard and soft coral, and sponges, there is a sea snake, a reptile related to cobras, in the video as well.

It is important to identify the sea snake as a reptile and not a fish. Sea snakes have lungs and must come to the surface to breathe air. They have the same characteristics as terrestrial snakes, with the exception of their paddle-like tail. As with terrestrial snakes, some species of sea snake give birth to live young, directly in the water, while other species lay eggs on land.

### Advance Preparation

- Teacher will need to preview the 360° video and be familiar with the technology used to view and manipulate the video
- Teacher will ensure student devices are preloaded or set to watch the video
- Teacher will review the background information provided regarding adaptations of marine animals

### Potential Misconceptions

- Fish, coral, sea snakes and other marine animals are not actually animals.
- Animals on land can live in the water and animals in the ocean can live on land
- Fish and other animals with gills do not breathe air, instead they breathe water. (Fish and other animals with gills are able to absorb the oxygen molecules dissolved in water, and do in fact breathe air.)

### Before Viewing

Discussion Question(s):

What are the needs of animals?

Student Activity: (*Access student prior knowledge and build background knowledge.*)

1. Review the characteristics of an animal
2. Review key terms from the unit on the needs of plants and animals.
3. Ask students to describe their favorite animal:
  - a. What does it look like?
  - b. How does it move?
  - c. How many appendages (arms/fins/legs) does it have?
  - d. What does it eat?
  - e. Where does it sleep?
  - f. How does it breathe?
  - g. Does it have eyes? If so, how many?

## While Viewing

Discussion Question(s):

- What animals do you see?
- What are the animals doing?
- How are the animals moving around?
- What do you think the animals eat?
- Where do you think the animals sleep?
- What color are the animals?
- What sort of body covering do the animals have?

*Student Activity: (How are students engaged? How are students recording their observations and processing what they are learning?)*

As students are watching the video ask them various discussion questions so they can make observations that will help them to complete all of the activities.

You may want to review the discussion questions as a class and permit students that did not notice something the opportunity to view the video again.

## After Viewing

Discussion Question(s):

- What sort of animals did you see?
- Where they all the same color / shape / size?
- How were the animals in the video different from animals that live on land?
- How were the animals in the video the same as animals that live on land?

*Student Activity: (How are students synthesizing and analyzing what they learned from the activity/video?)*

Students will illustrate their own marine creature, one that is theoretically capable of living in the ocean based on what they know about the characteristics and needs of animals that live in the ocean.

The creature should have similar characteristics (i.e. gills, scales, fins) as the organisms seen in the video, however as some students have more prior knowledge they may include characteristics and adaptations not seen in the video, such as those of marine mammals (i.e. blow holes, sparse hair) or sharks (i.e. sharp teeth, countershading) and that is acceptable. These characteristics are perfectly acceptable as they would conceivably help a creature survive in the ocean.

Alternatively, students can create a 3D model of their marine creature using recycled materials (e.g. paper, boxes, leftover craft supplies, bottles, tissue paper, drink cartons, etc.) as an art project.

## Extension Ideas

Students can create a diorama to go along with their new sea creature. The diorama should include all of the resources their creature would need to survive (i.e. water, food, shelter).