

Life on a Coral Reef

Elaborate

Grade: 4	Implementation Practice: Whole Class - Small Group - Individual
Subject Area: Science	Supporting Content: Language Arts and Writing
Objective(s): Students will write a composition based on their observations.	

Standards Addressed

NGSS	Performance Expectation 4-LS1-1: Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.		
	Disciplinary Core Idea(s)	Science and Engineering Practices	Crosscutting Concept(s)
	<ul style="list-style-type: none"> • LS1.A: Structure and Function 	<ul style="list-style-type: none"> • Engaging in Argument from Evidence 	<ul style="list-style-type: none"> • Systems and System Models
CCSS	ELA-Literacy W.4.1 Write opinion pieces on topics or texts, supporting a point of view with reasons and information.		

Vocabulary and Skills

Key Terms			Key Skills
animal	marine	coral	Observation
habitat	ecosystem	sea snake	Recording
ocean	diversity	reef	Narrative Writing

Essential Question(s):

How are marine animals similar to terrestrial animals? How are they different?

Guiding Question(s):

What features (characteristics) do marine animals have?

What are those features used for?

How are marine animals similar to each other, how are they different from each other?

How do animals depend on one another in their ecosystem?

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.

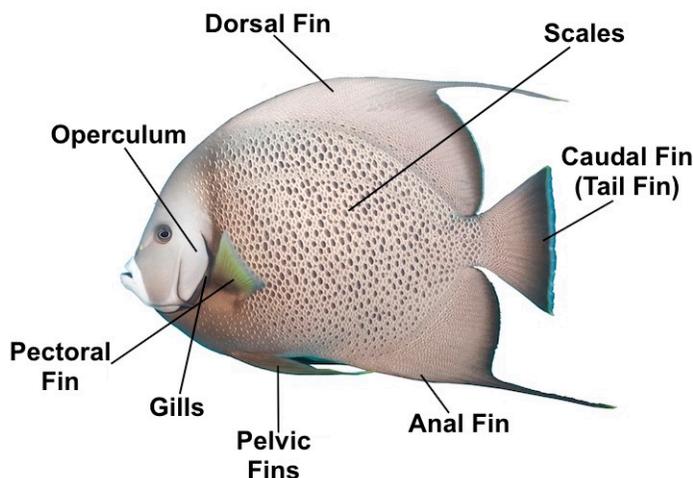
During the Elaborate phase, students are asked to recall their prior learning experiences to understand and explain new concepts and create conceptual connections between new and previous experiences. Students should be able to describe in their own words (illustrations, models, etc.) what they have 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 of Fish

All animals 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 life in the water.

For example: Fish have fins instead of arms and legs. They do not have lungs; they have gills for gas exchange. Fish are covered in scales rather than fur or feathers for protection. Some fish lay eggs, while other fish give birth to live young. However, all fish and other organisms that live in the ocean, have unique structures that serve to support their survival, growth, and reproduction. These structures are analogous to those of terrestrial animals that live on land.



Operculum – Protective covering of the gills

Dorsal Fin – Prevents rolling by stabilizing the body while swimming

Scales – Protective body covering

Caudal Fin – Helps to propel the fish forward

Anal Fin – Serves to stabilize the body while swimming

Pelvic Fins – Serve to stabilize the body and aid in sharp turns and sudden stops

Gills – Organs used for gas exchange

Pectoral Fin – Aid in maneuvering the body while swimming

Content Background – Types of Writing

There are four distinct styles of writing: narrative, descriptive, expository, and persuasive. All serve a unique purpose depending on the expectations of the assignment, audience, and the writer.

Narrative writing tells a story and is most commonly used when sharing a personal story and is often in the first person. Narrative writing is also employed when writing fictional plays or stories and generally includes a beginning, middle, and end.

Descriptive writing is akin to painting with words and is used to create a “picture” of a person, thing, place or idea. Generally, descriptive writing focuses on one subject and uses great details to describe that one subject. Often, figurative and metaphorical language is used in descriptive writing to create a vivid picture of the subject, which can be fictional or non-fictional.

Expository writing is direct and factual and includes the writing of directions, definitions, comparisons, and clarifications. This style of writing does not include opinions or descriptive detail. Expository writing requires a fairly strict organization that follows a plan and may include research to support ideas presented in the writing. Generally, scientific writing is expository in nature.

Persuasive writing requires the author to debate a topic, the purpose being to take a stance, then express their opinion in a way that convinces the read to agree with them, or see it the same way as them. This style of writing often includes research (facts/statistics) that supports the author’s point of view and disproves the opinion, or stance of the opposition.

In this lesson, students will be asked to describe the attributes of fish that make them suitable for life in the ocean. The style of writing is up to you/them. This is an opportunity to integrate science and writing skills, perhaps allowing students to see observation in science as an artistic endeavor.

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
- Access to students’ science (or writing) notebooks

Potential Misconceptions

- Fish are not animals
- Fish do not have the same needs as terrestrial animals
- Fish do not have the same, or similar, attributes of terrestrial animals to acquire what they need to survive

Before Viewing

Discussion Question(s):

What words would you use to describe a coral reef to a person who has never seen one before?

What types of creatures would you expect to see on a coral reef?

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

Generate a collaborative class list of nouns and adjectives regarding a coral reef. Students should record this list in their notebook.

Then, give the students 5-10 minutes to create a sketch of a coral reef in their notebooks. The sketch can include as many different animals as they like within the time limit.

While Viewing

Discussion Question(s):

- What animals do you see? (While the video is dominated by reef fish, there are coral [invertebrate animals] and a sea snake [vertebrate reptile].)
- What are the animals doing?
- What features do you notice of the reef?
- What attributes do you notice of the animals?

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

As students watch the video they should be recording their observations in their notebooks. Students may need to watch the video more than once to make complete observations.

After Viewing

Discussion Question(s):

- What animals did you observe? What were they doing? How were they doing it?
- What attributes (structures) do the animals have in common?
- How do those attributes help the animals to survive in the ocean?

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

Students should identify one animal from the video and, in their notebook, write a short story about it. They should include a description of the animal's attributes and how those structures help them to thrive in the ocean.

Writing prompt:

Recall the animals you observed in the video, identify one animal then describe what makes it uniquely suited for life in the ocean. Be sure to include how each of its body parts (structures) help it to survive and thrive on a coral reef.

Extension Ideas

- Students can present their writing to the class
- Students can work together to create a coral reef-themed play