

# THEME: Habitats - Coral Reefs



**Lesson Goal:** To develop knowledge of underwater sea creatures and coral reefs, including how this biome is depleting over time.

**Books Used in Lesson:** *Coral Reefs* by Anita McCormick

## Snapshot of Lesson:

- The facilitator elicits the children's prior knowledge of coral reefs.
- The children learn new vocabulary needed to understand the book through a play-based learning approach.
- The facilitator reads the text aloud to the children, applying the strategy of comprehension monitoring through questioning.
- The children respond to the text by answering literal, inferential, and evaluative questions.

- The children design underwater sea animal/plant puppets using felt and write a script for a puppet show which could be performed for their peers.
- The children engage in a visual art activity to develop an appreciation of the beauty of coral reefs and understand the danger that this habitat faces in modern times.
- The lesson concludes by recording what the children have learned on a mind map.

**Grade Level:** Grades 2-5 (Note: the activities in this lesson plan can be tailored to suit the needs of the specific group of children, at the discretion of the facilitator.)

**Time Frame:** 40-60 minute session

### **Background Information and Discussion Points for Facilitator:**

Coral reefs are underwater ecosystems formed of colonies held together by calcium carbonate.

***Coral Reefs*** is a nonfiction picture book describing one of the major marine biomes in the world. This book includes details such as the most appropriate temperature for coral reef growth, where the world's largest coral reef is located, as well as details on the flora and fauna that inhabit this biome. In this book, there are various references to the animal and plant species noted below, both in the text and in the pictures. The facilitator could visit this website to extend their personal knowledge on coral reefs: <https://www.natgeokids.com/ie/discover/geography/general-geography/coral-reef-facts/>

This book shows all measurements in metric units. Facilitators may use this as an opportunity to teach about different types of measurements around the world using Language Lizard's measurements lesson [here](#). The measurements lesson can be utilized as a co-curricular math activity. Metric to imperial conversions for all the measurements in the Habitat series can be found [here](#).

It may be helpful to the facilitator to be aware of where each of these species are located around the world, to support a fruitful discussion on the book content during and after the interactive read-aloud.



### Animal & Plant Species in the Book:

- **Page 2 - Angelfish:** This species is most abundant throughout the Caribbean.
- **Page 4 - Lionfish:** This species is native to the coral reefs in the tropical waters of the South Pacific and Indian Oceans.
- **Pages 6 & 21 - Clownfish:** This species is typically found in the warm waters of the Red Sea and the Pacific Ocean, as well as in sheltered reefs or lagoons.
- **Page 7 - Moray Eel:** This species is typically found in the western Atlantic Ocean and the northern Gulf of Mexico.
- **Page 8 - Manta Ray:** This species is found worldwide in tropical, subtropical, and temperate water.
- **Pages 12 & 13 - Coral Trout:** This species is typically found in the western tropical Pacific and around northern Australia.
- **Page 19 - Caribbean Reef Octopus:** This species inhabits many reefs and grass beds throughout the western Atlantic, Bahamas, Caribbean, and northern South America.
- **Page 20 - Porcupine Fish:** This species is typically found in the Mediterranean Sea, in the eastern Pacific Ocean, and in the western Atlantic Ocean.
- **Page 21 - Starfish:** This species is typically found in all of the world's oceans, from warm, tropical waters to the cold seafloor.
- **Pages 3, 4, 5, 12 & 14 - Sea Sponge:** As some of the most abundant and widespread sea species, sea sponges can be found from the colder arctic waters to the warmer tropics.

- **Pages 11, 15, 16 & 17 - Other Species:** The following species were pictured on the pages listed, occupying shallow waters near coral reefs all over the world: parrot-fish, seagrass, sea turtles, and seahorses.

## **Objectives:**

- **Knowledge:**
  - Learn and use new vocabulary words based on coral reefs.
  - Identify on a map where the largest coral reef in the world is located.
  - Identify the most appropriate temperature at which coral reefs grow.
  - Recognize the flora and fauna associated with this habitat.
- **Skills:**
  - Make inferences based on the illustrations in the book.
  - Use language to explain and describe one's thinking.
  - Use language to answer and formulate questions based on the text.
  - Perform a short script fluently.
  - Design and create one's own 3D model of the habitat.
- **Attitudes:**
  - Understand the role that humans play in the depletion of this biome over time.
  - Enjoy actively listening to the story being read in English and, where possible, in a second language. (If possible, the story could be read in a second language with the help of a bilingual parent, child, or teacher).
  - Appreciate the beauty of this habitat, and demonstrate the appeal of these aesthetics through visual art.



## **Materials and Resources:**

The text ***Coral Reefs*** by Anita McCormick; a map of the world; access to ICT (interactive whiteboard or laptop or tablet/iPad); ***Visual Art (Puppet Show)*** - felt (textile material), craft sticks, glue, scissors, paper, pencils, and eraser; ***Visual Art (3-D Model)*** - shoebox, paint, clay, cardboard, tape, scissors, tissue paper, glue, and string (optional).

## **Linkage and Integration Across Subject Areas:**

- **Creative Arts:** 3D model of habitat, characters of puppet show
- **Social Studies:** climate change; positioning of coral reef habitats on a map

## **Procedure:**

- **Introduction:**  
Elicit the children's prior knowledge of coral reefs. The children's responses should be recorded on a whiteboard/chart in the form of a mind map (using one color). This mind map will be revisited during the lesson conclusion.
- **Vocabulary Development:** The facilitator will introduce the following words, explain them using a child-friendly definition, and give several examples of how the word could be used in a sentence.
  - **marine:** relating to the sea
  - **excess:** more than the needed amount
  - **algae:** an aquatic plant
  - **prey:** an animal that is caught and killed by another for food
  - **predator:** an animal that catches and kills another
- **Vocabulary Game: Word Splash!**  
For this game, the image below will be visible on a screen to the students (Figure 1). This image contains synonyms of the new vocabulary learned. After being explicitly taught the new words above, the students will be encouraged to identify synonyms for the words presented in the image. For example, a student might choose the word 'extra' and identify that 'excess' is a synonym for the word 'extra'. They would then put the new word in a sentence - 'If I eat to excess, I will get sick'.



Figure 1. Word Splash! (generated using wordclouds.com)

- **Interactive Read-Aloud:** The facilitator will read the text, ***Coral Reefs***, aloud. The facilitator should pause on occasion to interact with the students by asking the questions below. Note: the word zooxanthellae is pronounced 'zoh-uh-zan-**thel**-uh'.
- **Reading Discussion to Encourage Reflection and Response:**  
Once the story has been read, allow for a class discussion based on the story. The facilitator may use questions from the list below or choose to ask other questions based on their own knowledge of the children with whom they are working.
- **Literal Questions:**  
*Readers use information directly from the text to answer this type of question.*
  - What are coral reefs?
  - What is coral?
  - What is the optimal (best) temperature for coral reef growth?
  - Name the largest coral reef in the world. Where is it located?
  - Name an algae that lives inside the coral.
  - How do the coral reefs stay healthy?
  - How much of the Earth's coral reefs have been lost since 1950?
- **Inferential Questions:**  
*Readers use the information in the text, as well as background knowledge, to deduce the answer (not explicitly stated in the text).*
  - Would coral reefs grow better in warm or cool climates?
  - Why are coral reefs important to sea life?
  - Why do you think the Earth has lost 50% of its coral reefs since 1950? What factors contributed to this depletion?

- **Evaluative Questions:**

*Readers use knowledge from their personal lives and of the wider world to answer this type of question.*

- How can we help preserve coral reefs, and support damaged reefs through recovery? What actions can we take as individuals and collectively?
- Is it important that scientists are given funding to undertake this research?
- Have you ever seen coral reefs before? Where? (in an aquarium) Should aquariums exist? Pros/Cons (argumentative talk: debate)

- **Response to Text (Group Activity): Puppet Show**

In groups, the students will create stick puppets using felt (textile material), craft sticks, glue, and scissors. Each child will make at least one puppet representing an animal or plant that lives underwater. They will cut out colored shapes that can be glued together to imitate an underwater sea creature/plant of their choice. They will then attach a craft stick to the base of the animals/plants, which can be used to maneuver the puppet around the space.

In groups, the children will then write a short script (less than 5 minutes in length) to capture the dialogue that might occur between these animals and plants underwater, utilizing the new vocabulary and facts learned in this lesson. The puppets could be used to enact the script and perform for the rest of the class. During the rehearsal phase of this task, the students will be encouraged to reread the script multiple times and pay particular attention to reading with varied intonation and expression. Importantly, rereading text is an evidence-based approach to improving reading fluency. By providing each group with the opportunity to perform their creation for the rest of the class, this task will become purposeful and authentic.

- **Response to Text (Individual/Pair/Group): 3-D Underwater Model**

Through the medium of visual arts, the students will be given the opportunity to respond aesthetically to the content of the text. This art activity involves the creation of a 3-D underwater model of the habitat and could be undertaken individually, in pairs, or in small groups.

To create this model, the students will first paint the inside of their shoebox to imitate an underwater scene. They will then use clay to imitate coral reefs, and paint the clay as appropriate. The clay could be glued to the base of the shoebox. The children could use cardstock to draw underwater sea creatures that they might expect to find in this biome, and paint them as appropriate. These creatures could be cut out using scissors and hung from the ceiling of the shoe box using string and tape, or glued to the walls of the shoebox. The children could reference the pictures in the text for color and design inspiration.

- **Conclusion:** The facilitator should revisit the mind map created at the start of the lesson. As a concluding activity, ask students to share what they learned from the

book and lesson. This new learning can be added to the mind map using a different colored marker. This activity will serve to consolidate what was learned during the lesson.



### Assessment:

- **Questioning:** The students will be asked literal, inferential, and evaluative questions by the facilitator during and after the interactive read-aloud to promote deeper thinking about the text and assess whether the class has developed a coherent understanding of the text.
- **Mind Map:** The whole-class mind map will record the knowledge learned during the lesson, highlighting what was known about coral reefs prior to the lesson, and what was learned (using different colored markers).
- **Puppet Show:** The children's performance of their self-written puppet show will assess the children's creativity and knowledge of the biome.
- **Walking Gallery:** The children will walk clockwise around the class to observe their classmates' 3-D models and write down one element of the artwork which they admire on the compliment sheet, which will be placed on the desk beside each 3-D model.

### Accommodations/Differentiation:

- **Differential Questioning:** Use of higher and lower order questioning (i.e., literal, inferential, and evaluative questions).

- **Wait Time:** Provide extra wait time and language scaffolds/supports for students who need them (e.g., showing pages from the book, sentence starters).
- **Visual Supports:** All students (but especially English language learners) will benefit from pictures accompanying the vocabulary to be learned in the story.
- **Mixed-Ability Groups:** This lesson uses mixed-ability groups to allow for peer support as a way of scaffolding the children's needs in the classroom.
- **Home-School Connection:** It may be helpful to allow English language learners (ELLs) to take home the dual language book either before or after the lesson. It could then be read at home in the child's home language prior to or after class engagement with the text. English language learners would feel more confident in talking about the book in class and would have a deeper understanding of the content if the book is read to them in their home language.
  - If possible, ask the parents of English language learners to record the book being read in one's home language. The book and the recording could then be shared at school so that other students can see and hear some of the home languages spoken by their classmates, deepening their appreciation for language diversity.
  - English language learners should use the QR code in the book to listen to an English recording of the book before class to increase their familiarity with the English vocabulary presented in the text.
- **Open-Ended Tasks:** This lesson includes an open-ended art task (3-D model) which allows children to respond to the text in innovative and creative ways, supported by CAST's Universal Design for Learning Framework.



## **Additional Resources:**

These resources will support the facilitator in building their own background knowledge on the topic of coral reefs. In addition, these resources could be used during independent research time in older elementary grades.

- [Coral reef facts for kids! - National Geographic Kids \(natgeokids.com\)](https://www.natgeokids.com)
- <https://youtu.be/65E1S2lFK44>
- [Science for Kids: Coral Reef Biome \(ducksters.com\)](https://www.ducksters.com)
- ["In the end we will conserve only what we love; we will love only what we understand; and we will understand only what we are \(noaa.gov\)](https://www.noaa.gov)
- [Coral Reefs: 18 Lessons, Books, Videos, Games & More to Teach Kids \(kidworld-citizen.org\)](https://www.kidworld-citizen.org)
- [KDE Santa Barbara \(ucsb.edu\)](https://www.ucsb.edu)