



a nonprofit membership organization dedicated to improving and protecting our coral reef ecosystem
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Virtual Marine Science Classroom

Unit 4: Marine Invertebrates

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Reef Relief Phone Number: 305-294-3100

Course Description: This unit was designed to supplement existing science coursework. Students will learn about various marine invertebrates, their taxonomy, species, and their importance.

Course Objective:

1. Students will be able to understand the importance of marine invertebrates.
2. Students will be able to understand the different marine invertebrate phyla.
3. Students will gain a better understanding of the natural world.

Attendance:

Students are able to complete this at their own pace. There are no deadlines for materials, and it is up to the student and parent/teacher to keep said student on their desired pace.

Internet Etiquette:

Reef Relief staff has enabled commenting on the materials. The comment sections shall be used to ask legitimate questions or voice formatting/technological issues. Should there be any concern about this please contact us.

Materials:

All course materials and worksheets are provided in an online PDF format. If your student does not have access to a printer, feel free to write down your answers on a separate piece of paper.

Technical Difficulties:

Please contact us via email or phone to let us know about any technical difficulties, we will be more than happy to assist!

Course Work:

Reef Relief has provided many different videos and activities for the students. Students are not required to complete all of the materials in this unit, it is ultimately up to the student, parent or teacher.

Skill Level:

Many activities are labeled Beginner, Medium, or Advanced and it is up to the adult to decide what they would like their student to complete. We recommend the following to evaluate:

- Beginner: Someone new to marine science or is between the ages of 5-8.
- Medium: Someone who has received a moderate amount of science education or between

the ages of 9-11.

- Advanced: Someone who is comfortable with more in depth science topics or between the ages of 12-17.

Grading:

Reef Relief will not be implementing any grading. Parents and teachers may make the personal decision to grade their student's work. There will be a section labeled answer keys that can be used to check your student's work.

Sharing of Material:

Please do not share classroom materials with others. This includes but is not limited to the class password, the class link, worksheets, video, etc.

Office Hours:

Reef Relief is open Monday- Friday from 10:00 AM until 4:00PM EST. Outside events may change these hours however we will do our best to respond as promptly as possible.

Feedback:

We appreciate your feedback! Please let us know if you have any questions, comments, or concerns by emailing us or posting in the classroom. There is also a survey within the unit you may submit your feedback in.

Unit 4 Syllabus

Pre-Quiz: We encourage every student to take the pre-quiz at the beginning of the course to evaluate their basic knowledge. The information compiled from this quiz will be used for Reef Relief's general knowledge and grant purposes.

Introduction:

- Lesson 1: Introduction to Invertebrates
 - Learn about invertebrates and get introduced to the major marine invertebrate phyla.
- Lesson Notes: Introduction to Invertebrates
 - Follow along worksheet you may complete during or after the lesson for review and retention.
- Lesson 1.5: Introduction to Marine Invertebrates (Beginner)
 - This lesson is an overview of the marine invertebrate phyla that are covered in the topics in this unit. This is meant to be an overarching lesson taught at a lower level than the content below.
- Lesson Notes: Introduction to Marine Invertebrates (Beginner)
 - Follow along worksheet you may complete during or after the lesson for review and retention.
- Worksheet: Invertebrate Matching (Beginner)
 - Color the invertebrates and draw a line connecting the invertebrates that are in the same phylum.
- Worksheet: Marine Invertebrate Phylum Guide
 - Fill this out during every lesson to have a complete study guide about the various invertebrate phyla.
- Interview with a Scientist: Dr. Edwin Cruz-Rivera
 - Join us in learning about the importance of marine invertebrates with Dr. Edwin Cruz-Rivera, and see some invertebrates under a microscope.
- Presenter Notes: Intro to Invertebrates
 - A copy of the PowerPoint slides to assist with activities.
- Presenter Notes: Introduction to Marine Invertebrates (Beginner)

- A copy of the PowerPoint slides to assist with activities.

Annelida & Platyhelminthes:

- Lesson 2: Marine Worms
 - Learn about worms from the phyla *Annelida* and *Platyhelminthes*. Discover how worms are classified and their insane variety.
- Lesson Notes: Marine Worms
 - Follow along worksheet you may complete during or after the lesson for review and retention.
- Worksheet: Create Your Own Marine Worm (Beginner)
 - Draw a worm and write down what it does and where it can be found
- Worksheet: Marine Worm Compare and Contrast (Medium)
 - Fill out the Venn diagram comparing *Annelida* and *Platyhelminthes*
- Activity: Worm Detective
 - Find an earthworm and spot its clitellum.
- Presenter Notes: Marine Worms
 - A copy of the PowerPoint slides to assist with activities.

Cnidaria:

- Lesson 3: *Cnidaria*
 - What are *Cnidaria*? Let's take a look at this exclusive marine phylum.
- Lesson Notes: *Cnidaria*
 - Follow along worksheet you may complete during or after the lesson for review and retention.
- Worksheet: *Cnidaria* Coloring Sheet (Beginner)
 - Color in the *Cnidaria*, try to name the species too!
- Activity: Create Your Own Coral Polyp (Beginner to Medium)
 - Complete during or after the lesson to create your own coral polyp.
- Worksheet: Types of Cnidarians (Medium)
 - Color the cnidarians and fill out the information about them using the presenter notes.
- Activity: *Cnidaria* Research Project (Advanced)
 - Research species within your favorite ecosystems!
- Bonus Video: How Does a Jellyfish Sting?
- Presenter Notes:
 - A copy of the PowerPoint slides to assist with activities.

Arthropoda:

- Lesson 4: *Arthropoda*
 - What is an arthropod? Chances are, you've seen one before! Let's learn about all the different types.
- Lesson Notes: *Arthropoda*
 - Follow along worksheet you may complete during or after the lesson for review and retention.
- Worksheet: Color the Arthropods (Beginner)
 - Color in the Arthropods and try to name the species.
- Worksheet: Who Am I? (Medium)
 - With the provided clues, try to guess the correct species.
- Interview with a Scientist: Berlynnna Heres
 - Let's talk to FWC researchers all about horseshoe crabs!
- Presenter Notes: *Arthropoda*
 - A copy of the PowerPoint slides to assist with activities.

Mollusca:

- Lesson 5: *Mollusca*

- Some of the most charismatic invertebrates, we will be learning about the different kinds!
- Lesson Notes: *Mollusca*
 - Follow along worksheet you may complete during or after the lesson for review and retention.
- Worksheet: Shell Coloring (Beginner)
 - Color the different mollusk species.
- Expert Interview: Abigail Ladner, Florida Fish and Wildlife Commission
 - Join us in talking to Abigail about her work with Bay Scallops and Oyster Reef Restoration.
- Bonus Video: Cephalopod Color Changing
- Bonus Video: The Mimic Octopus and Its Camouflage
- Presenter Notes: *Mollusca*
 - A copy of the PowerPoint slides to assist with activities.

Echinodermata:

- Lesson 6: *Echinodermata*
 - An ancient term for “Hedgehog” these invertebrates have incredible ways to survive.
- Lesson Notes: *Echinodermata*
 - Follow along worksheet you may complete during or after the lesson for review and retention.
- Worksheet: Echinoderm Coloring (Beginner)
 - Color the echinoderm species.
- Bonus Videos: Sea Star Eating
 - Outside View.
 - Inside View.
- Presenter Notes: Echinoderms
 - A copy of the PowerPoint slides to assist with activities.

Porifera:

- Lesson 7: *Porifera*
 - Introduction to Porifera! Listen in to learn about sponges and the different types of species that exist in our oceans and in freshwater.
- Lesson Notes: *Porifera*
 - Follow along worksheet you may complete during or after the lesson for review and retention.
- Worksheet: Word Search (Beginner to Medium)
 - Find words related to sponges
- Worksheet: Label the Sponge (Medium)
 - Fill out the different parts of a sponge
- Worksheet: Sponge Questionnaire (Advanced)
 - Fill in the blanks or answer the questions
- Interview with a Scientist: Elliot Hart
 - Learn from Elliot Hart who works in sponge restoration at FWC.
- Movie: Sponges
 - Watch this episode of Changing Seas to learn about the life history of sponges.
- Presenter Notes: *Porifera*
 - A copy of the PowerPoint slides to assist with activities.

Bonus Material:

- iSpy: Invertebrates
 - Practice your species identification with this interactive video.
- Movie: Prescription Oceans
 - Watch this episode of Changing Oceans to learn about the use of marine invertebrates

in medicine.

- Movie: Beneath the Bridge
 - Watch this episode of Changing Oceans to learn about marine life at the Blue Heron Bridge in Florida.

Post Quiz: We encourage every student to take the post-quiz at the beginning of the course to evaluate their basic knowledge. The information compiled from this quiz will be used for Reef Relief's general knowledge and grant purposes.

Answer Key: We have provided answers to most worksheet activities and have combined them into this folder for parents and teachers to check their student's work.