



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

Unit 2: Something's Fishy

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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 what makes a fish, types of fish, and their various adaptations they have to survive in the marine environment.

Course Objective:

1. Students will be able to understand what qualifies as a fish.
2. Students will be able to understand the different biology of various fish.
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 2 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 to Fish:

- Lesson 1: Fish Factors
 - Learn about what makes a fish, a fish!
- Lesson Notes: Fish Factors
 - Follow along worksheet you may complete during or after the lesson for review and retention.
- Lesson 1.5: Fish Factors (Beginner)
 - Learn about what makes a fish, a fish! Beginner level lesson.
- Lesson Notes: Beginner Fish Factors
 - Follow along worksheet you may complete during or after the lesson for review and retention.
- Worksheet: Fish Body Shapes (Beginner)
 - Draw a line matching the body shape to the fish with that body shape.
- Worksheet: Match the Caudal Fin (Beginner)
 - Match the type of caudal fin name to the correct shape.
- Worksheet: Internal and External Anatomy Labeling Activity (Medium)
 - Label and color in each fish outline with the organs and fish body parts listed in the word banks.
- Worksheet: Draw the Caudal Fin (Medium)
 - Draw the correct shape of the caudal fin in the box above the name.
- Worksheet: Guess the Fish Species (Medium to Advanced)
 - Read each fish description and circle which fish best fits with the characteristics listed.
- Activity: Fishing Regulation Game (Medium to Advanced)
 - Play this game to learn about fishing regulations.
 - Link: Florida Fish and Wildlife Regulations Chart

- Video Activity: Fish Dissection Video and Worksheet (Medium and Advanced)
 - Dissection Video: Experience a fish dissection with our educators. **Sensitive viewers be advised, video footage is unblurred of cutting into a real fish.*
 - Fish Dissection Worksheet: follow along with the dissection or complete after.
- Movie: No Fish Left Uncounted
 - Watch this episode of Changing Seas to learn about a fish census in Dry Tortugas National Park.
- Presenter Notes: Fish Factors
 - A copy of the PowerPoint slides to assist with activities.
- Presenter Notes: Beginner Fish Factors
 - A copy of the PowerPoint slides to assist with activities.

Osteichthyes- Bony Fish

- Lesson 2: Introduction to Bony Fish
 - Review what makes a fish a fish, learn the unique characteristics of Bony Fish, and identify Caribbean Reef fish .
- Lesson Notes: Bony Fish
 - Follow along worksheet you may complete during or after the lesson for review and retention.
- Worksheet: Color & Categorize the Fish (Beginner)
 - Color in the fish and circle the fish group it belongs to.
- Worksheet: Create Your Own Fish (Beginner)
 - Create your very own fish species using the knowledge you gained!
- Activity: Fish Identification (Medium to Advanced)
 - Practice your fish identification with this activity. All the fish pictured are fish displayed in Lesson 2. Get out a paper, label it 1-12 and identify the species, body shape, mouth location, and special characteristics.
- Worksheet: Create your own fish (Medium to Advanced)
 - Create your very own fish species using the knowledge you gained!
 - See attached example.
- Additional Resource: Fish Quiz!
 - Get even more fish ID practice with REEF's fish quizzes.
- Interview With A Scientist: Dr. Ross Boucek
 - Listen to this interview with Dr. Boucek, to learn about his career as a fisheries biologist and his work at Bonefish and Tarpon Trust. Learn more about why it is important we conserve and protect fish such as tarpon, bonefish, and permit and what methods biologists use to track and tag these fish species.
- Movie: Fishing the Flats for Science
 - Watch this episode of Changing Seas to learn about new conservation efforts for bonefish, tarpon, and permit.
- Movie: Billfish
 - Watch this episode of Changing Seas to learn about billfish research and conservation in South America.
- Presenter Notes: Bony Fish
 - A copy of the PowerPoint slides to assist with activities.

Chondrichthyes- Sharks:

- Lesson 3: Introduction to Sharks
 - Learn about what makes a shark, a shark!
- Lesson Notes: Introduction to Sharks
 - Follow along worksheet you may complete during or after the lesson for review and retention.
- Worksheet: Introduction to Sharks (Beginner)
 - Match the shark tooth to the shark species.
- Worksheet: Introduction to Sharks (Medium)

- Brainstorm: How can you let people know sharks aren't scary?
- Worksheet: Introduction to Sharks (Advanced)
 - Compare and contrast Chondrichthyes (sharks) and Osteichthyes (bony fish) characteristics.
- Activity: Shark Buoyancy Experiment
 - Test out how an oily liver helps a shark float.
- Presenter Notes: Introduction to Sharks
 - A copy of the PowerPoint slides to assist with activities.
- Lesson 4: Shark Senses
- Lesson Notes: Shark Senses
 - Follow along worksheet you may complete during or after the lesson for review and retention.
- Worksheet: Shark Senses Diagram (Beginner)
 - Label the shark senses in the diagram.
- Worksheet: Shark Senses Crossword (Medium)
- Presenter Notes: Shark Senses
 - A copy of the PowerPoint slides to assist with activities.
- Worksheet: Shark Senses Diagram (Medium to Advanced)
 - Label the shark senses in the diagram and answer the questions.
- Video Activity: Show and Tell
 - Take a look at some seriously cool shark's teeth with Ms. Dora. Try to guess who they belong to!
- Interview With a Scientist: Jaida Elcock
 - Learn about why there is no need to be afraid of sharks, why it's important to protect them, and why we need different perspectives and backgrounds in shark research with a graduate student from University of Washington and one of the co-founders of MISS: Minorities in Shark Sciences, Jaida Elcock.
- Movie: Biggest Fish in the Sea
 - Watch this episode of Changing Seas to learn about how changing shipping lanes in the ocean may protect whale sharks.
- Additional Resource: Jonathan Bird's Electrosensory Experiment
 - Experiment, Dive Deeper into a Shark's Electrosensory System.
- Additional Resource: Additional Resource: What If There Were No Sharks?
 - Watch this video to learn more about why sharks are important to our oceans.

Chondrichthyes- Skates & Rays:

- Lesson 5: Skates & Rays
- Lesson Notes: Skates & Rays
 - Follow along worksheet you may complete during or after the lesson for review and retention.
- Worksheet: Manta Ray Coloring (Beginner)
 - Design your own manta ray pattern!
- Worksheet: Skates & Rays Questions (Medium)
 - Let's see what you learned!
- Worksheet: Skates vs Rays (Medium to Advanced)
 - Can you tell the difference?
- Bonus Video: Tracking Manta Rays
 - How scientists are using bio-logging and peanut butter to research manta rays.
- Movie: Majestic Mantas
 - Watch this episode of Changing Seas and learn about tracking manta rays and conducting experiments to see if microplastics affect rays.
- Movie: Grand Cayman's Famous Stingrays
 - Watch this episode of Changing Seas and learn about the effect of human contact on the stingrays in the Cayman Islands.
- Movie: Saving Sawfish
 - Watch this episode of Changing Seas and learn about saving the endangered Smalltooth

Sawfish.

- Presenter Notes: Skates & Rays
 - A copy of the PowerPoint slides to assist with activities.

Life History (Advanced):

- Lesson 6: Life History of Fish
- Lesson Notes: Life History
 - Follow along worksheet you may complete during or after the lesson for review and retention.
- Worksheet: Fish Life Cycle (Advanced)
 - Fill out this worksheet with each life cycle stage and the characteristics of it.
- Interview With A Scientist: Dr. Will Heyman
 - Learn about spawning aggregations with one of the Gulf of Mexico's top bony fish spawning aggregation researchers.
- Movie: The Secret Life of Fish
 - Discover how some species of fish are capable of changing genders.
- Movie: Grouper Moon
 - See one of the last grouper aggregations in the Cayman Islands.
- Interview With A Scientist: Dr. Chris Koenig
 - Video: Learn about the life history of Goliath Groupers from the world's leading expert in the Atlantic Goliath Grouper.
 - Goliath Grouper Essay: Written by Dr. Koenig (mentioned in the interview).
 - Goliath Grouper Scientific Paper: View the research done by Dr.Koenig and his lab.
 - From Fishing to Conservation: Learn about the man that introduced Dr.Koenig to this important species.
- Movie: Super Grouper
 - Learn about the life history of the Goliath Grouper and the complications around their endangerment.
- Presenter Notes: Life History
 - A copy of the PowerPoint slides to assist with activities.

Tracking (Medium to Advanced):

- Lesson 7: Tracking
- Lesson Notes: Tracking
 - Follow along worksheet you may complete during or after the lesson for review and retention.
- Worksheet: Crossword Puzzle (Medium)
 - Complete this crossword to review tracking vocabulary.
- Interview With a Scientist: Sarah Burnsed
 - An interview with researcher Sarah Burnsed who works with active and passive tracking in Fort Meyers, FL.
- Additional Resource: OCEARCH
 - Track animals in real time!
- Bonus Video: How Does the Argos Doppler and Satellite Tracking Systems Actually Work?
 - A short video that gives you a visual example of how satellite tracking technology works.
- Bonus Video: Deploying Camera Tags on Sharks
 - This video is an example of using camera tags on sharks in the Indian Ocean.
- Movie: Tagging
 - Watch this to learn about tagging animals in order to track their behaviors.
- Presenter Notes: Tracking
 - A copy of the PowerPoint slides to assist with activities.

Bonus Material:

- iSpy: See if you can spot some of the animals you learned about in this unit!

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.