

Lesson Plans and Activities for Educators Grades 6-8

Coral Reef Resource Guide

Source: EPA and University of Southern Mississippi

Lesson Summary: A comprehensive and easy to use guide containing 55 lessons and activities related to coral reefs. Many activities can be adapted to various grade levels. Simply click on the pdf of the lesson you are interested in using in your classroom. English and Spanish.

Grade Level: K-12

Go to: <http://www.usm.edu/aquarium/old/coralreef/index.html>

Beach Profiling

Source: New Jersey Marine Sciences Consortium

Lesson Summary: Waves, wind and currents shape the beach redistributing tons of sand each day. During this activity, students gather data that measures the surface of the beach using a method that simulates the way marine scientists and coastal geologists study our dynamic beaches. Students will be able to understand that waves, winds, currents shape the beach and redistribute tons of sand each day; identify storm and tide levels as well as how a beach is changing over time; make and record observations; and graph the beach profile.

Grade Level: 6-12

Go to: http://www.njmsc.org/Education/Lesson_Plans/Beach_Profiling.pdf or
http://www.njmsc.org/Education/Lesson_Plans/Lesson_Plans.htm

Beach Zonation

Source: New Jersey Marine Sciences Consortium

Lesson Summary: During this activity, students investigate beach zonation by gathering and comparing sand samples gathered from different areas of the beach. Students will be able to identify and separate the different zones of the beach by observation of various visual characteristics, including grain size and composition; understand that the zones of the beach respond to weather, waves and human actions; draw conclusions about how beaches work.

Grade Level: 4-12

Go to: http://www.njmsc.org/Education/Lesson_Plans/Beach_Zonation.pdf or
http://www.njmsc.org/Education/Lesson_Plans/Lesson_Plans.htm

Blue Planet: Coral Seas

Source: Discovery School

Lesson Summary: Students will be work in small groups to identify basic information about coral polyps and coral reefs, coral reef habitats, and natural threats to coral reefs; create a poster related to one of these topics; and explain the topic to the class via a presentation. This lesson accompanies the Discovery Channel: Blue Planet Seas of Life series.

Grade Level: 6-8, adaptable to 9-12

Go to: http://school.discovery.com/lessonplans/programs/BP_coralseas/

Build a Fish

Source: New Jersey Marine Sciences Consortium

Lesson Summary: Students learn about fish anatomy and morphology and discover how the shapes of a fish's parts are related to how the fish functions. Younger students can also assemble a paper fish from prepared parts.

Grade Level: K-8

Go to: http://www.njmssc.org/Education/Lesson_Plans/Build_A_Fish.pdf or http://www.njmssc.org/Education/Lesson_Plans/Lesson_Plans.htm

Can't Stand the Pressure

Source: Coral Reef Adventure Film

Lesson Summary: Students will construct a device to experiment with pressure, density, floating and sinking, and will make observations of these phenomena.

Grade Level: 6-10

Go to: <http://www.coralfilm.com/CRAEducatorGuide.pdf>

Catch, Tag and Release

Source: New Jersey Marine Sciences Consortium

Lesson Summary: Determining the number of fish living in a given body of water is crucial to maintaining fish stocks and preserving species. During this lesson, students participate in a simulation of fish tagging and recapture, a method used by marine biologists and fisheries managers to estimate fish populations. Students will be able to apply estimation strategies for problem-solving purposes and become familiar with one aspect of a marine biologist's work.

Grade Level: 6-12

Go to: http://www.njmssc.org/Education/Lesson_Plans/Catch_Tag_Release.htm or http://www.njmssc.org/Education/Lesson_Plans/Lesson_Plans.htm

Caution: Do Not Bleach!

Source: NOAA NOS

Lesson Summary: Students will be able to identify and explain five ways that coral reefs benefit human beings; identify and explain three major threats to coral reefs; describe major components of the Coral Reef Early Warning System; identify and discuss actions that can be undertaken to reduce or eliminate threats to coral reefs; discuss at least one hypothesis that explains why corals under stress may expel their zooxanthellae.

Grade Level: 9-12, adaptable to 6-8

Go to: http://oceanservice.noaa.gov/education/kits/corals/lessons/coral_bleach.pdf or http://oceanservice.noaa.gov/education/kits/corals/supp_coral_lessons.html

A Chance of Success

Source: Sea World

Lesson Summary: The student will learn about the physical factors that limit where coral reefs develop.

Grade Level: 4-8

Go to: <http://www.seaworld.org/just-for-teachers/lisa/i-030/pdf/4-8.pdf>

Clarity and Turbidity

Source: New Jersey Marine Sciences Consortium

Lesson Summary: Students will be able to identify possible environmental complications that can be attributed to clarity and turbidity, and measure the clarity of a body of water.

Grade Level: 4-12

Go to: http://www.njmssc.org/Education/Lesson_Plans/Clarity_and_Turbidity.htm or http://www.njmssc.org/Education/Lesson_Plans/Lesson_Plans.htm

Classification of an Invertebrate: Sponge

Source: Collins High School

Lesson Summary: Student will become familiar with the sponge.

Grade Level: 6-8

Go to: <http://www.iit.edu/~smile/bi8807.html>

Coral Aging

Source: Nick Tagliareni

Lesson Summary: Using x-radiographs of slabbed coral cores, students will average coral growth rates over ten year increments and graph the results. To help students get a feel for the time frame associated with coral growth, they will identify world or U.S. events for some of the years listed.

Grade Level: 6-12

Go to: SEFCRI Teacher Resource CD

Coral Bleaching: Making Our Oceans Whiter

Source: National Geographic

Lesson Summary: Students will understand what coral reefs are; where they are located, and how humans impact their future; build writing skills and search the internet for relevant information; and gather the knowledge to critically reason and debate issues about coral reefs.

Grade Level: 6-8

Go to: <http://www.nationalgeographic.com/xpeditions/lessons/04/g68/bowercoral.html>

Coral Bleaching: What's the Role of Water Temperature?

Source: NOAA CHAMP

Lesson Summary: Students will be able to graph and analyze data sets and determine the temperature threshold required to start a coral bleaching event.

Grade Level: 6-8, adaptable to 9-12

Go to: <http://www.coral.noaa.gov/cleo/pdf/Bleaching%20Lesson.pdf> or <http://www.coral.noaa.gov/cleo/education.shtml>

The Coral Game

Source: University of Texas

Lesson Summary: Students will learn coral reef ecology and the current dangers facing coral reefs through role play.

Grade Level: 6-8

Go to: <http://www.utmsi.utexas.edu/staff/dunton/GK12/lessons/TheCoralGame5E.doc>

Coral Reef Book

Source: Discovery School

Lesson Summary: Students will be able to write and illustrate short books that explain to younger children how the animals that inhabit coral reefs are uniquely suited to their environment.

Grade Level: 6-8, adaptable to 9-12

Go to: <http://school.discovery.com/lessonplans/programs/coralreefs/>

Coral Reef Café

Source: Coral Reef Adventure Film

Lesson Summary: Students will simulate the variety of methods with which different fishes on a reef feed. Learn how the size and shape of a fish's mouth and teeth provide hints about what type of food it eats.

Grade Level: 3-8

Go to: <http://www.coralfilm.com/CRAEducatorGuide.pdf>

Coral Reef Crossword Puzzle

Source: FKNMS

Lesson Summary: Students will complete a crossword puzzle using general coral reef knowledge.

Grade Level: 6-12

Go to: SEFCRI Teacher Resource CD

Coral Reef Jeopardy

Source: Florida Sea Grant

Lesson Summary: Based on the game Jeopardy!, students will be challenged to compose the correct question when an answer is given related to coral reef biodiversity, reproduction, zonation, threats and facts about southeast Florida coral reefs.

Grade Level: 5-12

Go to: SEFCRI Teacher Resource CD

Coral Reef Models

Source: USGS

Lesson Summary: This activity contains instructions and patterns for preparing a set of four, three-dimensional paper models that schematically illustrate the development of island coral. These models are intended to help students visualize the growth of coral on an island and to learn some of the terminology used by earth scientists to describe coral reefs. Students will achieve a greater appreciation of the relations between volcanic islands, the growth of coral reefs, and atolls.

Grade Level: 6-8

Go to: <http://wrgis.wr.usgs.gov/docs/parks/sea/4reefs1.html>

Coral Reef Race for Survival

Source: Coral Reefs: An English Compilation of Activities for Middle School Students

Lesson Summary: Students will identify at least three ways corals benefit people; name three natural disturbances to coral reefs and three human induced threats to coral reefs; increase their knowledge on the survival needs of corals; and gain insight on ways to protect corals from human disturbances.

Grade Level: 3-8

Go to: SEFCRI Teacher Resource CD

Coral Reefs, Polyps and Heads

Source: Bermuda Biological Station for Research and the College of Exploration

Lesson Summary: Students will learn about how coral communities form, and assist in the building of a model.

Grade Level: 6-10

Go to: http://www.coexploration.org/bbsr/coral/lessons/hilda_2.html

Coral Spawning

Source: NOAA CHAMP

Lesson Summary: A simple and effective lesson that allows students to explain why corals gain some reproductive advantage by spawning all at once.

Grade Level: 6-8, adaptable to 9-12

Go to: http://www.coral.noaa.gov/cleo/modules/spawning_educational_module.pdf or <http://www.coral.noaa.gov/cleo/education.shtml>

Coral: What Portion is Alive?

Source: Coral Reefs: An English Compilation of Activities for Middle School Students

Lesson Summary: Students will comprehend the living portion of stony corals are all on the exterior non-attached surface.

Grade Level: 6-8

Go to: SEFCRI Teacher Resource CD

Design a Fish

Source: Gulf of Maine Aquarium

Lesson Summary: Students will design a fish adapted for a coral reef and another for cold marine environments.

Grade Level: 6-12

Go to: <http://octopus.gma.org/surfing/ocean/fish.html>

Effects of CO₂ on Coral Reefs

Source: NOAA CHAMP

Lesson Summary: Students will be able to explain the role of carbon dioxide (CO₂) in photosynthesis and cellular respiration and carbonic acid's impact on calcification and dissolution of coral skeletons, and its ability to influence pH.

Grade Level: 6-8, adaptable to 9-12

Go to: <http://www.coral.noaa.gov/cleo/pdf/CO2Activity.pdf> or <http://www.coral.noaa.gov/cleo/education.shtml>

Fish Morphology

Source: New Jersey Marine Sciences Consortium

Lesson Summary: Students study the parts of a fish to develop the understanding that the shape, form and structure of a fish's parts influence its lifestyle and behavior. Students will be able to identify the various parts of a fish; describe the concept of fish morphology; relate shape,

form and structure of a fish's parts to function; and draw inferences about where and how fish might live based on its morphology.

Grade Level: 3-12

Go to: http://www.njmssc.org/Education/Lesson_Plans/Fish_Morphology.htm or http://www.njmssc.org/Education/Lesson_Plans/Lesson_Plans.htm

Growing Coral

Source: Sea World

Lesson Summary: Students will observe the growth of crystals that develop in a way similar to how coral polyps create their calcium carbonate cups.

Grade Level: 3-8

Go to: <http://www.seaworld.org/infobooks/Coral/gcoral.html>

Guess Who?

Source: Treasures@Sea

Lesson Summary: On index cards write the names of different ocean animals. Students draw a card and research the animal on it. On the back of the card they should write facts about their animals such as; where it lives, what it eats, what color/shape it is, is it a predator or prey? When finished, they can swap with a partner to guess what animal the description is for.

Grade Level: 6-8

Go to: <http://www.fi.edu/fellows/fellow8/dec98//writ.html>

How to Hide in the Ocean

Source: Woods Hole Sea Education Association

Lesson Summary: Students will observe and discuss the advantages of camouflage, then try their hands at designing a well-camouflaged fish.

Grade Level: K-8

Go to: <http://www.sea.edu/academics/k12.asp?plan=hideinocean>

Keeping Watch on Corals

Source: NOAA NOS

Lesson Summary: Students will be able to identify and explain five ways that coral reefs benefit human beings; identify and explain three major threats to coral reefs; describe major components of the Coral Reef Early Warning System; identify and discuss actions that can be undertaken to reduce or eliminate threats to coral reefs; obtain and analyze several types of oceanographic data from remote-sensing satellites.

Grade Level: 9-12, adaptable to 6-8

Go to: http://oceanservice.noaa.gov/education/kits/corals/lessons/coral_mgmt.pdf or http://oceanservice.noaa.gov/education/kits/corals/supp_coral_lessons.html

Let's Make Waves

Source: Treasures@Sea

Lesson Summary: An effective experiment to teach how waves are created. In this simple set of activities children use wind to create waves and use marbles to model energy moving through water.

Grade Level: 6-10

Go to: <http://www.fi.edu/fellows/fellow8/dec98/lessons/index.html>

Mapping the Ocean Floor

Source: New Jersey Marine Sciences Consortium

Lesson Summary: Students will be able to develop the understanding that the bottom structure of underwater habitats can be mapped; describe something they cannot see through the collection and correlation of accurate data and understand how technology can be applied as a tool for problem-solving. During this lesson, students participate in a simulation of the pre-sonar method of mapping underwater terrain.

Grade Level: 6-12

Go to: http://www.njmssc.org/Education/Lesson_Plans/Mapping_The_Ocean_Floor.htm or http://www.njmssc.org/Education/Lesson_Plans/Lesson_Plans.htm

Mealtime for Corals

Source: Coral Reefs: An English Compilation of Activities for Middle School Students

Lesson Summary: This activity illustrates the feeding activity of a coral colony. Individual polyps, though connected, feed independently.

Grade Level: K-8

Go to: SEFCRI Teacher Resource CD

Microfishing Lesson Plan

Source: Woods Hole Sea Education Association

Lesson Summary: Students use a simple method to collect living microorganisms from natural and/or artificial environments and develop skills in microscopy, observation, drawing, speculation, hypothesizing, oral presentation, and raising questions. This activity arouses curiosity and provides a fascinating look at a world we rarely get to see.

Grade Level: 6-12

Go to: <http://www.sea.edu/academics/k12.asp?plan=microfishing>

Ocean Careers Exploration

Source: Jean-Michel Cousteau Ocean Adventures

Lesson Summary: Students will gather information about the various careers of the members of the Ocean Adventure expedition team and learn about the strengths of having a team of diverse individuals working on a task.

Grade Level: 6-10

Go to: <http://www.pbs.org/kqed/oceanadventures/educators/oceancareers/>

Oxygen in Water

Source: New Jersey Marine Sciences Consortium

Lesson Summary: By sampling and testing a water sample, students will gain an understanding of dissolved oxygen and its importance to life in an aquatic ecosystem. Students will be able to use a test kit to determine the amount of dissolved oxygen in a water sample; determine if the dissolved oxygen level is reflective of a healthy system; and develop an understanding of how oxygen enters and exits water.

Grade Level: 6-12

Go to: http://www.njmssc.org/Education/Lesson_Plans/Oxygen_In_The_Water.htm or http://www.njmssc.org/Education/Lesson_Plans/Lesson_Plans.htm

Pretty Smart for a Hammerhead

Source: Shedd Aquarium

Lesson Summary: Sharks are often viewed as primitive fishes. Yet, they have highly developed senses — even one that allows them to locate prey by sensing its electricity! Students will be able to model how sharks locate prey by sensing electrical charges and describe the function of the ampullae of Lorenzini.

Grade Level: 6-9

Go to: http://www.sheddaquarium.org/sea/lesson_plans.cfm?id=32 or http://www.sheddaquarium.org/sea/search_results.cfm

Protecting the Reef is More Than Just a Game!

Source: Coral Reef Adventure Film

Lesson Summary: Students will understand that there are many actions, both positive and negative, that can affect the health of a coral reef.

Grade Level: 6-10

Go to: <http://www.coralfilm.com/CRAEducatorGuide.pdf>

Reefs at Risk

Source: Shedd Aquarium

Lesson Summary: Each plant and animal is integral to the balance of life on the coral reef. Find out what could happen if any of these organisms should disappear. Students will make a mobile to represent the food pyramid of the coral reef and consider the impact of human activities on individual species and on the reef as a whole.

Grade Level: 6-10

Go to: http://www.sheddaquarium.org/sea/lesson_plans.cfm?id=42 or http://www.sheddaquarium.org/sea/search_results.cfm

A Reef of Your Own

Source: NOAA NOS

Lesson Summary: Students will be able to describe and explain the importance of asexual and sexual reproductive strategies to reef-building corals; explain why it is important that reef-building corals have a nutritional strategy that includes both photosynthesis and carnivory; describe two behaviors that reef-building corals use to compete for living space with other species; explain how coral reefs can produce high levels of biological material when the waters surrounding these reefs contain relatively small amounts of the nutrients normally needed to support biological production.

Grade Level: 9-12, adaptable to 6-8

Go to: http://oceanservice.noaa.gov/education/classroom/lessons/01_reef.pdf or http://oceanservice.noaa.gov/education/kits/corals/supp_coral_lessons.html

Remote Sensing and Coral Reefs

Source: NOAA Satellite and Information Service

Lesson Summary: Coral reef and ocean curriculum that includes seven lessons on: Remote Sensing and the Electromagnetic Spectrum, Altimetry, Phytoplankton and Ocean Color, Introduction to Coral Reefs, Symbiosis and Coral Anatomy, Sea Surface Temperature and Coral Bleaching, and Coral Reef Conservation.

Grade Level: 4-6, adaptable to 9-12

Go to: http://coralreefwatch.noaa.gov/satellite/education/reef_remote_sensing.html

Reef Partners Wanted

Source: Coral Reef Adventure Film

Lesson Summary: Students will identify several reef partnerships and describe how the organisms help each other.

Grade Level: 6-12

Go to: <http://www.coralfilm.com/CRAEducatorGuide.pdf>

Shark!

Source: Sea World

Lesson Summary: Students explore the natural history of sharks and recognize that humans are an interconnected part of sharks' ecosystems. The student will be able to identify and describe various shark adaptations; compare and contrast sharks and bony fishes; use a dichotomous key to identify shark families; discuss what sharks eat; demonstrate the steps of the writing process; create an artistic impression of a fish; and discuss why sharks need conservation and how people can help conserve sharks.

Grade Level: 4-8

Go to: <http://www.swbg-animals.org/just-for-teachers/guides/pdf/shark-4-8.pdf>

Sinking Races

Source: Woods Hole Sea Education Association

Lesson Summary: Students will build plankton models and compete to see which sinks most slowly.

Grade Level: 2-8

Go to: <http://www.sea.edu/academics/k12.asp?plan=sinkingraces>

Sea Connections

Source: Smithsonian

Lesson Summary: Students will be able to identify producers and consumers from four marine ecosystems; describe the delicate balance among organisms in each environment; construct a food chain or web from a marine ecosystem; and list some of the human activities that can upset the balance in marine environments.

Grade Level: 6-10

Go to: http://www.smithsonianeducation.org/educators/lesson_plans/ocean/connect/essay.html

Threat Ranking

Source: PADI

Lesson Summary: Students will brainstorm to identify perceived local threats to coral reefs; select those which they feel they could realistically help reduce; and rank those selected threats from most severe to least severe. The threat ranking promotes small

group discussion and helps to identify local priorities for community-based conservation solutions.

Grade Level: 6-12

Go to: SEFCRI Teacher Resource CD

Water Clarity

Source: Bermuda Biological Station for Research and the College of Exploration

Lesson Summary: Students will determine the relative clarity of different bodies of water and discuss why corals need clear water.

Grade Level: 6-10

Go to: http://www.coexploration.org/bbsr/coral/lessons/felice_1.html

Water Salinity

Source: Bermuda Biological Station for Research and the College of Exploration

Lesson Summary: Students will determine the salinity of different samples of water using a variety of methods and discuss how corals can tolerate some variation in the salinity of their environment.

Grade Level: 6-10

Go to: http://www.coexploration.org/bbsr/coral/lessons/felice_2.html

What if the Reef Dies?

Source: Bermuda Biological Station for Research and the College of Exploration

Lesson Summary: This lesson will provide opportunities to model, using simple laboratory materials, some aspects of reef ecology. In addition, student conclusions drawn from the activities will be referenced to known data. Finally, students will be asked to consider what they can do to insure reef survival.

Grade Level: 6-10

Go to: http://www.coexploration.org/bbsr/coral/lessons/gail_2.html

What's My Name?

Source: Sea World

Lesson Summary: The student will learn to use a dichotomous key to identify a variety of reef organisms.

Grade Level: 4-8

Go to: <http://www.seaworld.org/just-for-teachers/lisa/i-030/pdf/4-8.pdf>

Where's the Salt?

Source: Bermuda Biological Station for Research and the College of Exploration

Lesson Summary: Students will show students how porous limestone filters saltwater.

Grade Level: 6-10

Go to: http://www.coexploration.org/bbsr/coral/lessons/felice_3.html

Who Has the Data?

Source: NOAA NOS

Lesson Summary: Students will be able to describe and explain the importance of asexual and sexual reproductive strategies to reef-building corals; explain the need for baseline data in coral

reef monitoring programs; identify and explain five ways that coral reefs benefit human beings; identify and explain three major threats to coral reefs.

Grade Level: 9-12, adaptable to 6-8

Go to: http://oceanservice.noaa.gov/education/classroom/lessons/01_data.pdf or
http://oceanservice.noaa.gov/education/kits/corals/supp_coral_lessons.html

Working as a Team

Source: Smithsonian Tropical Research Institute

Lesson Summary: Students will learn that interactions between organisms go beyond predator and prey.

Grade Level: 6-10

Go to: http://www.stri.org/english/visit_us/culebra/PDFs/lets_work_on_groups.pdf or
http://www.stri.org/english/visit_us/culebra/education.php