

# OCEAN CLASSROOM

## **The Study of Corals**

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## **Efforts to Save Coral Reefs**

STUDENT GUIDE

THE  
UNIVERSITY  
OF RHODE ISLAND  
GRADUATE SCHOOL  
OF OCEANOGRAPHY

## Guiding Question

## “How can we save coral reefs?”

### Informational Essay: Coral Restoration

#### Structural Restoration

Structural restoration generally involves the construction of artificial reefs, sinking of wrecks, or relocation of rocks/dead coral heads. The goal is to increase the amount of reef structure and habitat available for the corals and other reef organisms to grow on. Structural restoration is required in areas where the reef has been lost due to disturbances such as blast fishing, boat grounding, dredging, landslides. In areas which have been reduced to rubble or sand, corals will not have solid structure to attach to and will end up being broken off or buried during high waves. Ecosystems in these damaged areas can take decades to recover, and many never do so on their own.

#### Biological Restoration

Biological restoration focuses on increasing the success of coral reproduction in order to create

new individual colonies on a reef. Living corals are placed on reefs where structure is already available. This is generally achieved through methods such as collecting and rehabilitating naturally broken coral fragments, propagating coral colonies, cultivating coral larvae, or transplanting living coral colonies.

#### Physical Restoration

Physical restoration involves fixing the conditions in which the corals are growing to improve their health, growth rates, or reproductive ability. These methods have generally been developed more recently, and include mid-water coral nurseries or using devices that speed mineral growth. Mid-water nurseries are used as a staging area for rehabilitation of damaged or reproducing corals before they are placed back out onto artificial or natural substrates.

#### Videos on Restoration

[http://response.restoration.noaa.gov/sites/default/files/voetrader-coral-restoration-video\\_final.mp4](http://response.restoration.noaa.gov/sites/default/files/voetrader-coral-restoration-video_final.mp4)

<https://ocean.si.edu/ecosystems/coral-reefs/connecting-coral-reefs>

<https://oceantoday.noaa.gov/restoringcoralreefs>

**Activity:****Coral Conservation**

Coral restoration is one of the many conservation activities used to help coral reefs! Research coral conservation activities. Then, go to the videos below to learn more:

**Videos about Saving Coral Reefs:**

<https://oceantoday.noaa.gov/restoringcoralreefs/>

<https://oceantoday.noaa.gov/fullmoon-whatcanwedo-coral/welcome.html>

[https://www.youtube.com/watch?v=ytXM5IKva0g&ab\\_channel=Waterlust](https://www.youtube.com/watch?v=ytXM5IKva0g&ab_channel=Waterlust)

[https://www.youtube.com/watch?v=8hknaJQRh8s&ab\\_channel=Travel%2BLEisure](https://www.youtube.com/watch?v=8hknaJQRh8s&ab_channel=Travel%2BLEisure)

**Growing Corals**

[https://www.youtube.com/watch?v=48PxHyaK3GA&ab\\_channel=SECOREcoral](https://www.youtube.com/watch?v=48PxHyaK3GA&ab_channel=SECOREcoral)

[https://www.youtube.com/watch?v=qHKpcnn5Tws&ab\\_channel=TheAtlantic](https://www.youtube.com/watch?v=qHKpcnn5Tws&ab_channel=TheAtlantic)

**Genetics and Super Corals:**

<https://oceantoday.noaa.gov/fullmoon-scienceofsupercorals/welcome.html>

[https://www.youtube.com/watch?v=6QqZ7b7ILjM&ab\\_channel=NationalGeographic](https://www.youtube.com/watch?v=6QqZ7b7ILjM&ab_channel=NationalGeographic)

<https://theconversation.com/heat-tolerant-corals-can-create-nurseries-that-are-resistant-to-bleaching-116675>

<https://theconversation.com/meet-the-super-corals-that-can-handle-acid-heat-and-suffocation-122637>

**Activity:****Design a Mailer for a Coral Reef Conservation Group****Assignment:**

Your group must select an agency or organization that helps coral reefs. You need to design an informational sheet (11' X 8.5") that will be mailed to people all over the world. Your mailer must include:

- 1.Name of Organization
- 2.Picture or Symbol for the organization
- 3.Purpose Statement (What you want to get accomplished)
- 4.Current Facts about Coral Reef Threats (Why coral reefs need saving)
- 5.Explain at least three ways this organization is helping save the coral reefs
- 6.Two Photos or diagrams with a caption

Here is a partial list of organizations that work to save coral reefs. There are many, many more. Pick an agency from below or feel free to find another. Research and read about their efforts, and then work as a group to create your mailer.

- Global Coral Reef Alliance
- ICRS International Coral Reef
- Reef Relief
- National Oceanic and Atmospheric Administration (NOAA)
- Ocean Preservation Society
- Great Barrier Reef Foundation
- Environmental Protection Agency (EPA)
- Nature Conservancy
- World Wildlife Foundation (WWF)
- Florida Department of Environmental Protection

## Research:

## Environmental Solutions

We have created many problems for mother Earth. Now we must find solutions. Your job will be to choose ONE of the following environmental problems/issues and research potential solutions. You will, through online research find 3 options currently “in the works” (research and development) or lifestyle changes which may help, and to make a determination of which holds the most promise. You need to think about cost, feasibility, production, and how likely the “idea” is to be mass produced, and/or “catch on” in society. Which of the solutions you research can potentially turn this around most effectively in your opinion? You will formulate an argument outlining why one particular solution is better. Remember much of this has to do with economics, education, and the psychology of getting the public to support the solution. I am looking for innovative ideas!

### Current Issues:

1. CO<sup>2</sup> emissions from manufacturing/cars
2. Plastics and garbage in our oceans
3. Over-packaging for all products, as well as food
4. Acidification of oceans/air/rain
5. Consumerism—too much buying, leading to waste.
6. Habitat loss/species extinction
7. Renewable energy sources
8. Human population control
9. Waste/recycling in general
10. Over Fishing/Over Use

**Note:** If there is a particular issue not on this list which you would like to research, please come to me and we can discuss it as an option!

### What you need to do:

1. Choose a topic
2. Research three potential solutions and fill out a framework for each (you will have three)
3. Choose which solution you feel is most effective or offers the most promise
4. Write an argument (three paragraphs) citing research.

# Research Framework/ Organizer for Environmental Solutions

Fill out the following sheet. (Details/information can be bulleted.):

What is the issue?  
Explain HOW the problem  
came to be.  
(This only needs to be stated  
on ONE of these sheets.)

How does this affect the  
economy/environmental  
health ?  
(Impact of issue)

**Source #1**  
for potential  
SOLUTION ideas.

**Source #2**  
for potential  
SOLUTION ideas.

**Source #3**  
for potential  
SOLUTION ideas.

# Research Framework/Organizer for Environmental Solutions (continued)

**Summarize** Using this solution, which do you feel is the best option?

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**Presentation** You will present your information to the class. Please do not read directly off your essay. Pretend you are a reporter on the news!!

**Grading** Your essay will be graded according to this rubric.



**Activity:****Design a Super Coral**

View the videos about super corals listed below. Also, read through the article listed below. Your group has been hired by the governments of the biggest nations on earth. Your job is to create a super coral that can survive while under the threats/pollution that are harming coral reefs today. You must answer the following questions, as well as draw a picture of your super coral.

**Genetics and Super Corals:**

<https://oceantoday.noaa.gov/fullmoon-scienceofsupercorals/welcome.html>

[https://www.youtube.com/watch?v=6QqZ7b7ILjM&ab\\_channel=NationalGeographic](https://www.youtube.com/watch?v=6QqZ7b7ILjM&ab_channel=NationalGeographic)

<https://theconversation.com/heat-tolerant-corals-can-create-nurseries-that-are-resistant-to-bleaching-116675>

<https://theconversation.com/meet-the-super-corals-that-can-handle-acid-heat-and-suffocation-122637>

**Questions:**

1. What is the name of your super coral?
2. Where in the world can your super coral live/survive?
3. What are the threats/pollution that are present in your location?
4. What special qualities/characteristics does your super coral have to fight these threats? (Name three.)
5. How does your super coral use its special characteristics to fight the threats/pollution?

**Picture:**

Put the name of your super coral at the top of the paper. Draw a detailed, colorful picture of your super coral. Be sure to label its special qualities/characteristics.