

Coral Reefs of Palau

Virtual Field Trip Found Here:

<https://www.youtube.com/watch?v=4-AWW9cCwi8&feature=youtu.be->

This visually stunning virtual field trip takes students to the diverse and crucial coral reef ecosystems of Palau. Topics such as interdependence, adaptations, and human impacts and solutions are covered in-depth. Set up as an interview between a Nature Conservancy educator and a marine biologist, this field trip answers questions and accepts input from real school children around the country.

Time: 45 minutes (for virtual field trip)

Extension activity requires 15 minutes for set up and short daily observations for 7+ days

Grades: 3-8

NYSSLS Connections

- 3. Interdependent Relationships in Ecosystem
- 3. Inheritance and Variation of Traits: Life Cycles and Traits
- 5. Earth's Systems
- MS. Matter and Energy in Organisms and Ecosystems
- Ms. Interdependent Relationships in Ecosystems
- MS. Human Impacts

Accompanying Activities

Nature Conservancy resources and teacher guide found here, the fifth link down:

https://www.nature.org/en-us/about-us/who-we-are/how-we-work/youth-engagement/nature-lab/virtual-field-trips/?utm_source=Social&utm_medium=FB&utm_campaign=WAT_MDR&utm_content=TNC_1711_Article

Resources include:

1. Discussion questions
2. Related resources
3. "Nature Spy" game to play along with during the virtual field trip
4. Field trip log worksheet

Extension Activity

[Ocean Acidification Demonstration](#)

Background

Ocean acidification is one of the most pressing threats to coral reefs globally and it is directly linked to climate change. As more carbon dioxide enters the atmosphere and the oceans, the oceans become more acidic. Right now, oceans are basic, meaning they have a pH higher than 7. Plants and animals are adapted to these conditions, and even slight changes in the acidity can be detrimental to the growth, reproduction, and survival of marine organisms.

Corals make their skeletons out of calcium carbonate and in a slightly more acidic ocean, these minerals become harder to find and utilize. If the water becomes even more acidic, coral skeletons and other shells may even begin to dissolve.

In terms of the following demonstration, it is important to note the following:

- Egg shells, like coral skeletons, are made out of calcium carbonate.
- White vinegar is a highly acidic substance with a pH around 2.4.
- A neutral pH is 7.
- Oceans currently have a pH around 8.1.

Materials

Cup (large enough to hold 1 egg; clear)

White vinegar

Egg

Procedure:

1. Place a raw egg in a cup and fully cover it with vinegar.
2. Leave it for 24 hours. After 24 hours, observe what changes have occurred with the egg.
3. Once observations have been made, carefully dump the old vinegar out and replace it, covering the egg once more with vinegar.
4. Leave the egg for 7 days, one whole week! Do not disturb the egg but make daily observations.
5. After 7 days, drain the vinegar and observe what has happened to your egg.
6. Students should compare the dissolving of the egg shell with the dissolving of the coral skeleton that occurs during ocean acidification.

Follow-Up Experiment

Test if adding certain variables will cause the egg to dissolve slower or faster!

For example, repeat the experiment but with three cups of eggs and vinegar this time to answer the following question: does temperature affect how quickly the egg shell dissolves?

Use the following:

1. Cup in a neutral space like a countertop (room-temperature)
2. Cup in the refrigerator (cold)
3. Cup on a windowsill in the sun (warm)

At the end of the seven days, determine if temperature had any effect on how quickly the egg shells dissolved, and if so, which temperature had the greatest effect?

Finally, discuss how these findings may relate to climate change, ocean acidification, and the overall health of coral reefs.

Additional information on ocean acidification found here:

<https://www.noaa.gov/education/resource-collections/ocean-coasts/ocean-acidification>