

RESOURCE LIBRARY

ACTIVITY : 1 HR

Laysan Albatross Virtual Bolus Dissection

Students use online videos and photo galleries to conduct a virtual bolus dissection for the Laysan albatross. They investigate how marine debris can be mistaken for food and harm marine organisms.

GRADES

9 - 12+

SUBJECTS

Biology, Ecology, Earth Science, Oceanography, Geography, Human Geography, Physical Geography

CONTENTS

2 Links, 2 PDFs, 3 Videos, 13 Images

OVERVIEW

Students use online videos and photo galleries to conduct a virtual bolus dissection for the Laysan albatross. They investigate how marine debris can be mistaken for food and harm marine organisms.

For the complete activity with media resources, visit:

<http://www.nationalgeographic.org/activity/laysan-albatross-virtual-bolus-dissection/>

DIRECTIONS

1. Activate students' prior knowledge.

Have students brainstorm different types of debris, or trash. List their ideas on the board.

Ask:

- *How does trash get into the ocean? Where does it go? How does it travel?*
- *What impact does trash (marine debris) have on the ocean and organisms in the ocean?*

Elicit from students that trash that does not make it to a landfill can become litter found along the sides of roads or in waterways, eventually ending up in the ocean. Emphasize that no matter where litter comes from, wind, streams, and ocean currents carry litter throughout the globe, including the ocean and coasts where it becomes marine debris.

2. Build background about marine debris and the albatross.

Have students view SchoolTube's *Good Morning America* video, "The Great Pacific Garbage Patch" (4 minutes, 30 seconds total; stop after 3 minutes, 30 seconds). As they watch, have students note the types, shapes, and sizes of marine debris they see. Briefly discuss student observations. Next go to the NG Education encyclopedic entry for *marine debris*. Invite volunteers to read aloud a couple of the captions related to marine debris as you click through the photo gallery. Show the albatross carcass image and read the caption to the students. Tell students that they will observe the dissection of an albatross bolus. Explain that a *bolus* is formed from undigested materials that the bird then regurgitates as part of its normal feeding process. Distribute and allow students time to read the provided Laysan Albatross fact sheet. Ask students to share facts that they found interesting after reading about this species' life history, especially its diet. Explain that albatross are carnivores that feed mostly on squid and fish but also consume floating garbage, either intentionally or unintentionally.

3. Introduce and provide context for the virtual bolus dissection activity.

Distribute the Albatross Bolus-Dissection Activity Sheets. Explain that the albatross bolus is composed of animal parts albatross cannot digest, like squid beaks, and other materials they eat accidentally, like rocks and wood. As trash and plastics accumulate as marine debris, albatross accidentally eat these materials. Marine debris is found with more frequency in regurgitated bolus. Use the worksheet to focus student attention:

- Before viewing the dissection, tell students to record hypotheses about the types of items that they think they will find in the bolus and the reason for their predictions.
- While observing the virtual dissection, tell students to pay close attention to the number of plastic items versus natural items extracted from the bolus, and the size and color of these items.

4. Have students view the virtual bolus dissection flipbooks and photo gallery.

View the dissection media in the following order, allowing students time to complete their worksheets:

- Flipbook: Opening the Bolus
- Flipbook: Squid Beak Extraction
- Flipbook: Foreign Materials Extraction
- Bolus Dissection Photo gallery

5. Have students discuss and draw conclusions about the virtual bolus dissection.

After students have completed the Albatross Bolus worksheet, lead a discussion of their findings and conclusions. First ask students to summarize the ways in which marine debris affects the life and health of the Laysan albatross. Then ask:

- *Why would plastics be a problem if ingested by the albatross?*
- *Do you think that the bird that regurgitated this bolus felt full?*
- *What are the health implications of a bird “feeling full” after eating the materials that were extracted from the bolus?*
- *What have you heard about BPAs or other plastic leaching agents?*
- *Could these toxic substances create health problems for the albatross? How? Why?*

6. Have students reflect on what they have learned.

Ask:

- *Could marine debris and the substances it contains create health problems for other ocean animals? Which ones? What about humans?*
- *What is being done to combat the global problem of marine debris?*
- *What can you do to combat the global problem of marine debris?*

Informal Assessment

Assess students' completed Albatross Bolus-Dissection Activity Sheets for completion and accuracy.

Extending the Learning

Have students go to the [NOAA Marine Debris](#) website to read more about other impacts of marine debris, including wildlife entanglement, alien species transport, and economic threats. Have students research programs and organizations working to combat the negative impacts of marine debris. Ask them to share what they learned with the class.

OBJECTIVES

Subjects & Disciplines

Biology

- [Ecology](#)

Earth Science

- [Oceanography](#)

Geography

- [Human Geography](#)
- [Physical Geography](#)

Learning Objectives

Students will:

- identify sources and examples of marine debris
- describe how marine debris affects the life and health of the Laysan Albatross
- predict negative impacts marine debris has on other ocean organisms

- discuss how humans contribute to and help solve problems associated with marine debris

Teaching Approach

- Learning-for-use

Teaching Methods

- Discussions
- Information organization
- Multimedia instruction
- Reading

Skills Summary

This activity targets the following skills:

- 21st Century Themes
 - Global Awareness
- Critical Thinking Skills
 - Analyzing
 - Understanding
- Geographic Skills
 - Acquiring Geographic Information

National Standards, Principles, and Practices

NATIONAL GEOGRAPHY STANDARDS

- Standard 1:

How to use maps and other geographic representations, geospatial technologies, and spatial thinking to understand and communicate information

- Standard 14:

How human actions modify the physical environment

- Standard 8:

The characteristics and spatial distribution of ecosystems and biomes on Earth's surface

NATIONAL SCIENCE EDUCATION STANDARDS

- (9-12) Standard C-4:

Interdependence of organisms

- (9-12) Standard F-4:

Environmental quality

- (9-12) Standard F-5:

Natural and human-induced hazards

OCEAN LITERACY ESSENTIAL PRINCIPLES AND FUNDAMENTAL CONCEPTS

- Principle 6d:

Much of the world's population lives in coastal areas.

- Principle 6e:

Humans affect the ocean in a variety of ways. Laws, regulations and resource management affect what is taken out and put into the ocean. Human development and activity leads to pollution (such as point source, non-point source, and noise pollution) and physical modifications (such as changes to beaches, shores and rivers). In addition, humans have removed most of the large vertebrates from the ocean.

- Principle 6f:

Coastal regions are susceptible to natural hazards (such as tsunamis, hurricanes, cyclones, sea level change, and storm surges).

- Principle 6g:

Everyone is responsible for caring for the ocean. The ocean sustains life on Earth and humans must live in ways that sustain the ocean. Individual and collective actions are needed to effectively manage ocean resources for all.

Preparation

What You'll Need

MATERIALS YOU PROVIDE

- Pencils

REQUIRED TECHNOLOGY

- Internet Access: Required
- Tech Setup: 1 computer per classroom, Projector, Speakers
- Plug-Ins: Flash

PHYSICAL SPACE

- Classroom

GROUPING

- Large-group instruction

OTHER NOTES

Before starting the activity, download and queue up the video and photo galleries.

BACKGROUND & VOCABULARY

Background Information

Marine debris is any manufactured solid material that enters the marine environment, either intentionally or unintentionally. It has become one of the most pervasive pollution problems facing the world's oceans and waterways. A variety of marine debris, especially plastics, can be found in large quantities throughout the ocean and can cause severe problems for marine organisms, including the Laysan albatross, that ingest it. Scientists are learning more about these impacts by collecting and dissecting albatross boluses.

Prior Knowledge

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Recommended Prior Activities

- [Marine Debris: A Legacy of Litter](#)

Vocabulary

Term	Part of Speech	Definition
Great Pacific Garbage Patch	<i>noun</i>	area of the North Pacific Ocean where currents have trapped huge amounts of debris, mostly plastics.
marine debris	<i>noun</i>	garbage, refuse, or other objects that enter the coastal or ocean environment.

For Further Exploration

Websites

- [National Geographic Education: National Teacher Leadership Academy \(NTLA\)](#)
- [NOAA: Marine Debris](#)

FUNDER

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