Albatross Bolus Investigations Set Up Directions

1. Place small, common debris items in a tub at the station.

2. Set six bottles with lids at the station. They should be wide mouth (about 1.5 inches) and approximately 12 ounces in volume to represent the stomach of an albatross chick.

3. Place the sample bolus at the table for display only. Keep it in the plastic bag so pieces are not lost.

4. Make 1 copy of the Bolus Sorting Data Sheet for every student. Leave these data sheets at the station.

5. Make copies of the Albatross – A Case Study background information sheet for the students to read at the station.

6. Arrange the photos of ingested plastic at the station.

7. Place the four Dissected Bolus photos along with magnifying glasses at the station. For younger students, use zoomed in photos so the objects are larger.

Lesson adapted from *Winged Ambassadors Curriculum*, Oikonos Ecosystem Knowledge. Used with permission. These high resolution images were created by National Geographic photographer David Liittschwager and donated for educational use only. The boluses from Tern Island and Kure Atoll were provided by U.S. Fish and Wildlife Service and the State of Hawaii Department of Land and Natural Resources. The contents were prepped by Hawaii Pacific University and Oikonos as part of a research study on plastic ingestion by Pacific albatrosses breeding in Hawaii. This program was created by NOAA's Cordell Bank National Marine Sanctuary, Papahānaumokuākea Marine National Monument, and Oikonos Ecosystem Knowledge.

Albatross Bolus Investigations
Student Instructions

Model Stomach (activity #1)

1. Begin by reading the Albatross – A Case Study background information.

2. Choose a plastic bottle. This bottle will represent the stomach of an albatross chick. It is approximately the same size as an albatross stomach, and the mouth of the bottle is about as wide as an albatross throat.

3. Select 1-2 pieces of plastic debris from the tub and place them into your bottle. Close the "beak" by putting the bottle cap back on. Carefully shake the albatross stomach.

4. Open the beak, tip the stomach over, and see if the plastic pieces will empty out of the stomach like a bolus.

5. If the plastic comes out, put those pieces back in and add 2 more pieces. Close the beak. Shake the stomach. Open the beak. Empty the stomach.

6. Continue adding plastic until the bolus becomes so big that it gets stuck and cannot fit out of the throat.

7. Shake or poke inside of the stomach so you can remove the plastic pieces.

8. Count the number of plastic pieces and return them to the tub of marine debris. Place the empty bottle with lid back on the station table.

9. Answer the following questions in your science notebook:
   - How many pieces of plastic were in the mock bolus that was too big to be regurgitated?
   - What effects would a stomach full of plastic have on an albatross?

10. Move on to the Bolus Sorting activity.

Albatross Bolus Investigations
Student Instructions

Bolus Sorting (activity #2)

1. Take a moment to look closely at the sample bolus. Please do not touch it or take it out of the bag – it is fragile!

2. Look at the photos of plastic items found in birds. How do these photos make you feel?

3. Find a partner in your group and take a Bolus Contents data sheet.

4. With your partner, choose one of the photos of a dissected bolus to examine. Write the type of bird and breeding location at the top of your Bolus Contents data sheet.

5. Using a magnifying glass, examine the dissected bolus photo with your partner and record the items you see on your data sheet.

6. Answer these questions in your science notebook:
   - Were there more prey or non-prey items in the bolus?
   - What was the strangest non-prey item in the bolus?
   - Choose one non-prey item from the dissected bolus. Where do you think this debris originally came from? Have you used an object like this before?

7. If you have time left at this station, work with your partner to sort the contents of another bolus. Change one variable, so choose either a different species of albatross from the same island, or the same species of albatross at a different island.

