Mōlī Life Cycle Program

Kilauea Point National Wildlife Refuge

Updated 10-2025

Lesson 3: Bolus Dissection

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| Grade Level | 3 |
| Next Generation Science Standards (NGSS) | 3-LS4-4:  Students who demonstrate understanding can make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change. |
| Bullseye outlineStudent Learning Target | I can propose a **solution** to **human-caused** marine debris. I can make a claim about how that solution will help decrease marine debris and where it will fall short. |
| Materials | * Bolus (1 per every 2 students) * Trays * Tweezers * Disinfecting wipes and hand sanitizer |
| Set up | * Organize materials on a table so they are easy for students to collect. * Make sure Power Point is up. |
| Introduction and Building Background Knowledge(5 minutes) | Explain how chicks our reliant on their parents for food and will regurgitate boluses.   * *“Hatchlings cannot go out to sea, so they are reliant on their parents to feed them. Prior to* ***fledging*** *chicks will* ***regurgitate*** *all the indigestible their parents have fed them. This regurgitation is called a* ***bolus. “***   Review adaptations (wing-span, hooked beak, and weebed feet) from lesson one.   * *“Mōlī are well adapted to fish on the surface. Food like squid and fish eggs are on the surface. “*   Have students make predictions on the boluses and model a dissection.   * Ask students based on what albatross eat what do they predict they will find in the bolus. * Make a list on the board of student predictions. Have students fill out their predictions in their journal. * Model a quick scientific illustration and/or writing a description. * Model a bolus disection. Collect data in the student journal as an example.   + Use a document camera if provided. If there is not a camera, have students come closer or circle around so they can see. |
| Small Group Work: (20 minutes) | Bolus dissection   * Put students in pairs. Instruct students to *not* touch the bolus until they receive their tweezers. Hand out one bolus per pair for observation. * Have students make their own scientific illustration with a title and lables or write an observation of the bolus. * Once students are finished making observations hand out tweezers. * Walk through as they are working and assist anyone who looks like they need help. Engage the students in small discussions using the following prompting questions:   + *“What is that?”*   + *“Did you expect to find that?”*   + *“How would you feel if your parents fed you that?”* * Have students clean up their work station, pack their bolus back up so they can be used by other classes, and return their materials. Students should wash their hands. |
| Whole Group Lesson(15 minutes) | **Discuss:**   * Discuss the objects such as plastic that were found.  Ask why they think there was plastic in the bolus. * Look at the list of what they thought would be in the bolus. Ask the students if they had all the items in their bolus. Ask them why they think the bolus may not all be the same.   + *“Fish eggs are laid on anything floating in the ocean, including plastic debris.  When the albatross eats the eggs, they also eat the structures on which the eggs were laid. Fish eggs used to be laid on floating driftwood or pumice stone but now it is more common to find it on plastic.”* * Volunteer educators – be on the lookout for pumice stones, fish eggs and squid eyes.     **Dead bird/ Stomach contents slide**   * *“The image is of a found dead chick that was dissected. The chick had never been out to sea only ate food from its parents.”* * See if students can identify any items in the birds stomach contents. Ask the to brainstorm how the chick died, and reinforce that if the chick has too much plastic they can starve to death because they are not eating enough food.   Review **Learning Target:**  I can propose a **solution** to **human-caused** marine debris. I can make a claim about how that solution will help decrease marine debris and where it will fall short.  Great Pacific Garbage Patch   * Show the diagram of the Great Pacific Garbage Patch. * Ask students to brainstorm some of the problems due to having large quantities of garbage in our ocean. * Have them add 2 problems to their graphic organizers. One of them should relate to how it harms wildlife, including albatross.   + *“What can we do about the marine debris problem? Brainstorm some solutions as a class and add them to the graphic organizer on the power point.”* |
| Independent work(3 minutes | Have students write their own solutions in their journal. |
| Closing(5 minutes) | Model picking one solution from your graphic organizer and discussing the advantage of that solution.   * *i.e.* “*Doing a beach clean up will help us have cleaner beaches and create cleaner habitats for animals that live near beaches, however it won’t help clean up the waters where albatross and many other animals feed.”*   Have students discuss their own solutions with a partner. Have them rate on a scale of 1-10 how good of a solution it would be by holding up their fingers. |