The Sea Bird Mystery Lesson Overview (2-3 days)

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| Period | Activity | Vocabulary & Guiding Discussion Questions |
| Engaging students with an introduction to the topic. Assessing prior knowledge and listening to the Sea Bird Mystery story. Exploring the food web of the mystery bird. | Teacher:   * Introduce Lesson Objectives * Assess Student Prior Knowledge * Review graph interpretation   Students:   * Listen to The Sea Bird Mystery story * Collaboratively, students evaluate the evidence in the story and in the Data Section to determine the identity of the Mystery Sea Bird and to develop the sea bird’s food web. | **Key Words**  Alcid  Phytoplankton  Zooplankton  **Questions**  Have you been to the beach in summer? What was it like?  What are some of the animals you saw when you were at the beach?  “With a title like “The Seabird Mystery”, what do you think this story is going to be about?  Have you guessed the identity of the Mystery Sea Bird? What evidence did you use to make your decision?  What do you think the Mystery Sea Bird eats?  Where is the Mystery Sea Bird’s place in the Pacific Coast ecosystem? |
| Discussion of the cause-effect relationships disrupting the ecosystem of the mystery sea bird. | Teacher:   * Assess student progress in interpreting and analyzing the data to identify the Mystery Sea Bird and to determine the cause of the massive die-off of the alcids. * Review key concepts of upwelling, the jet stream, ocean currents, global winds, and the phenomenon of the Hot Blob with students.   Students:   * As a class, interact with teacher-guided presented videos and graphics of the key concepts. * In small groups, collaborate to define the chain of cause and effect relationships between the abiotic and biotic factors in this system. | **Key Words**  Brood  Continental Shelf  Deviation  Metric ton  Prevailing winds  Hot Blob  Upwelling  Jet Stream  California Current  Ridge of high-pressure air  **Questions**  (Referring to the graphs in Figures 3 & 4.):  What variable is on the x-axis? What variable is on the y-axis? What are the units of measure for each axis?  What does the trendline in the graph of global ocean heat content tell us?  What do the trendlines in the graphs of populations sea birds tell us?  How hot is the warm ocean water in the Hot Blob?  Is the temperature of the water so high that it is killing the zooplankton and fish that are the auklet’s source of food?  How does presence of the Hot Blob affect the Polar Jet Stream?  How does changing the path of the Polar Jet Stream affect global winds along the Pacific Coast?  How does the Hot Blob affect the winds along the Pacific Coast?  Why would weakening prevailing winds along the Pacific Coast interfere with upwelling?  How does upwelling affect the abundance of small fish and krill at the surface of the ocean where the Mystery Sea Bird lives?  If there is little or no upwelling occurring in the Pacific Northwest coast, how would marine life be affected? |
| Deepen understanding of the marine ecosystem. | Teacher:   * Evaluates the students’ response to the questions on the Student Worksheet (Online Supplemental Material) * Clarifies any misconceptions noted in student responses. * Once students have a clear understanding of what has caused the decimation of the Cassin’s Auklet population as portrayed in the story, they can be tasked with filling in a graphic organizer that defines the auklet’s ecosystem. (Online Supplemental Materials)   Students:   * Work collaboratively to complete the graphic organizer(Online Supplemental Materials) for this portion of the marine food web. | What are the matter inputs and outputs?  What are the energy inputs and outputs?  How do the parts interact?  What are the living (biotic) factors in this system?  What are the non-living (abiotic) factors in this system? |