

Details



Completion Time: About 1 Period

Permission: Download, Share, and Remix

Little Auk Survival Challenge

Overview

Dividing the class into little auks (*Alle alle*) and predators, students complete a survival game for several “seasons.” After tallying up the total volume of food collected, survival rates of the chicks can be graphed and analyzed.

Objectives

Students will be able to experience the hazards that little auks must avoid in order to survive. Students will understand the value of different food sources and their availability and how the quality and quantity of available food determines chick survival. Students will learn the possible consequences that warmer ocean currents may have on little auks worldwide.

Lesson Preparation

Students will research what is currently known about little auks, including their geographic distribution, their ecological niche and their life cycle. Students will learn what invertebrates and calinous copepods are and find out the optimal marine conditions they live in. Students may use the PolarTREC website link to the “Greenland Seabird Ecology Expedition” (listed below) to find out about current research being done on this species.

Procedure

Game Preparation

Set up the playing area and disperse the small food items, placing the heavier food items farther away and the lighter ones closer to the nesting area.

Materials

- Cones and rope or another means to mark the perimeter of the “breeding area”
- Popped popcorn, dry beans, cheerios, kix, raisins or other small items to represent food of different weights.
- T-shirt or means to identify the glaucous gull
- T-shirt or means to identify the arctic fox
- Film canisters or small paper or plastic bags (snack size) for little auks to collect food to bring back to the chicks
- 5-8 pieces of paper with each student’s name on it to be placed in the baggies for personal identification



Goal

Little auks need to collect food to take the food back to the nest. Every pouch of food is weighed before the little auk leaves for another forage trip. At the end of the season, the total amount of food is weighed to determine if the little auk received enough food to allow their chick to successfully fledge that season.

Starting the Game (See diagram attached)

Divide up the group, so that for every 32 students, 30 become little auks, 1 becomes a glaucous gull, and 1 becomes an arctic fox. Divide the 30 little auks into pairs of two little auk parents who must work together to raise one chick. Pass out 4 small bags to each little auk (8 bags per nest). Assume that each two little auk parents have one chick back at the nest. Make sure each pair of parents knows the exact location of their nest (pile of bags). Have each little auk put their marked paper with their name in their store of bags before the game begins. Have students leave the bags visible so it is known where each nesting site is.

The glaucous gull and arctic fox have the following roles in the game, and should wear a special colored shirt or other item so they can be readily indentified:

Glaucous Gull

Their role is to walk back and forth through the breeding grounds. Every time a glaucous gull comes within a body's length of the little auks, the auks must all run away in a large circle, and return to their nests. If a gull can reach out and touch a little auk, that little auk returns to the gull's nest and is eaten, and so is removed from the game.

Arctic Fox

Every two minutes the arctic fox can move through the nesting area once. If a little auk is not present, he can pick up one bag of food from that nest and take it back to his den. That signifies that one chick is gone. After two minutes he can move back to the nesting area and repeat.

Identify an area that will be the nesting slope where each little auk parent brings their bag back and picks up another bag. The little auks must mark their bags with the slips of paper so that after they lay the bags down in that area, it is where each parent must return to, laying down a full food bag and picking up an empty bag.

Identify the area of the ocean, and spread the popped popcorn, dry beans, Cheerios, Kix cereal, raisins or other small items throughout to represent the food items that the little auks are foraging for. Scatter the lighter food close to the area designated for nesting and the heavier food further away. Students are not to know whether there is any significance to



the different types of food.

Beginning the Game

Tally up the number of chicks at the beginning of the season (if there are 30 students, there will be 15 chicks in the first round). Record this number for the first round on the "Adult/Chick Survival Record Sheet."

On the whistle, let the game begin. Each pair of little auks sits at a nest. One student of the pair grabs a bag and runs to the food collection area trying to get enough food to fill the bag. When he/she returns to the nest and drops off the load of food the second parent moves out and does the same. Alternating, each parent flies out to forage enough food for his or her chick.

The parent remaining must watch out for glaucus gulls and arctic foxes. When the gull begins to move through the nesting site, the remaining little auks must fly out before it comes nearby to avoid being eaten. The gull must walk across the entire nesting site before turning around. If it tags a little auk parent, it must take that parent back to its nest to be eaten. That little auk parent is gone from the game. Eating takes 2 minutes, and after capturing an auk, the gull cannot return to the nest area for 2 minutes.

When the remaining parent returns to the nest, it must fly out again to collect food for its chick and cannot stay and guard the nest. Once eight food loads have been brought back to the nest, both parents can stay at the nest until the gull comes through hunting.

After the designated time (5-8 minutes) the game stops. Each pair of parents collects and weighs their bag and records the weight. The facilitator records adult/chick survival based on the guidelines below.

- Record the combined weight of the bags.
- If the food collected weighs at least 20 or 25g then the parents have fledged a healthy chick and there will be one more parent for the next year.
- If the total food is less than 20 g then the chick was not given enough food and it does not survive to the next season.
- If the fox took the food, the chick died.
- If the gull took a parent, then it dies.

After the tally is completed for one year, the remaining parents (ones that were not eaten by the gull) can pair up in new pairs so that for the next round there are two parents feeding one chick. The food is scattered again in the sea before beginning the next round.

Play this game for 5 rounds or "seasons" (5-8 minutes). After each round, total the number



of chicks that fledged, based on enough food being delivered.

Create a line graph of the total food collected by parents each season for the five seasons.

Answer the following questions.

1. Graph the results; years versus population numbers
2. Why are there two different types of food? What does each type signify?
3. Was the population stable over the five-year period examined?
4. What might happen if the only food available was popcorn?
5. List 5 ways this simulation was similar to real life.

Extension

Conduct a web research assignment on little auks and find out what the most recent research indicates about their population stability. Take time to research additional arctic seabirds or other arctic wildlife, and their population dynamics.

Resources

"Greenland Seabird Ecology" PolarTREC Expedition Link:

<http://www.polartrec.com/greenland-seabird-ecology>

Little Auks as Marine Predators in a Changing Arctic:

<http://polar.alaskapacific.edu/aharding/lampca.html>

WWF, the global conservation organization:

http://panda.org/about_wwf/

AB 04.05 Auk clue to climate impact

<http://www.birdguides.com/species/species.asp?sp=063001>

Assessment

Students will graph results and correctly respond to the questions correlated to the activity.

Credits

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National Science Education Standards (NSES):

Content Standards, Grades K-4

Content Standard A: Science As Inquiry

- a. Abilities necessary to do scientific inquiry
- b. Understandings about scientific inquiry

Content Standard C: Life Science

- a. Characteristics of organisms
- b. Life cycles of organisms
- c. Organisms and environments

Content Standard F: Science In Personal and Social Perspectives

- a. Characteristics and changes in populations
- b. Types of resources
- c. Changes in environments

Other Standards:

N/A

