

Sample Lesson from the Math in a Cultural Context

Module: *Going to Egg Island*

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Sample

Activity 3:

Grouping Black-Legged Kittiwakes

Students listen to chapter 3 of *Egg Island* and learn about several sea birds that live in the Togiak region: murre, kittiwakes, arctic terns, and puffins. They also learn to distinguish the different bird eggs by their shape, size, and color. The Teacher Note at the end of this activity provides in-depth information on the ecology of seabirds. This lesson is best done as an interdisciplinary one with an emphasis on math and science. Connections to geography are also important here.

As students learn about seabirds, murre, and kittiwakes in particular, they practice grouping in ones, twos, and threes. Small numbers are a good introduction to the concept of grouping, which is the major focus of this module and which is an essential strategy in counting large numbers. Grouping is also important to help students think flexibly about numbers. Objects can be arranged in a variety of ways. For example, a student can take a sum such as 7 and arrange the objects as a set of seven individual ones, or $6 + 1$, $5 + 2$, and so on. Also, numbers can be decomposed in a variety of ways. In the following activities, methods of grouping become increasingly more advanced until, by the end of the module, students are grouping in fives, tens, twelves, and twenties.

Goals

- To learn about the ecology of sea birds in Bristol Bay
- To count the number of chicks in each nest and the total number of chicks in the colony
- To understand and interpret a table

Materials

- Story book, *Egg Island*
- Poster, Egg Island Map with grid
- Transparency, Birds of Egg Island and Their Eggs
- Transparency, Parts of a Sea Bird
- Transparency, Portion of Black-Legged Kittiwake Nesting Colony
- Transparency, Chick Tally

- Handout, Egg Island Map (from Activity 1)
- Handout, Entire Black-Legged Kittiwake Nesting Colony (one per pair of students)
- Handout, Chick Tally (one per pair of students)

Duration

One class period.

Vocabulary

Table—a way to organize data.

Grouping—a way of ordering objects or numbers into distinct patterns.

Preparation

Read the Teacher Note about the ecology of seabirds in Bristol Bay in preparation for an in-class discussion on this topic.

Resources

<http://www.state.ak.us/local/akpages/FISH.GAME/wildlife/geninfo/educate/awc.htm>

This Alaska Department of Fish and Game website has excellent resources on Alaska wildlife and curricular material, including Project Wild. Many links to other sites.

http://www.sf.adfg.state.ak.us/Region2/ie/Teacher_Resources/html/teachres.htm

This is another Alaska Department of Fish and Game website, Alaska Correlations. Our hands-on activities are in line with the Alaska State Content Standards. Use this resources guide in lesson planning to address the standards.

Instructions

1. Read chapter 3 from *Egg Island* to your students. Hand out or have the students use their Egg Island maps with grid. Have them locate on their grids the places where the characters travelled.
2. Show the transparency, Birds of Egg Island and Their Eggs.
3. Ask students to describe some of the differences among the types of seabirds.
4. Ask them to describe some of the differences among their eggs.
5. Show the transparency on the parts of a seabird and discuss these parts with the students.
6. Ask the students to share other information that they have about the seabirds. What do they eat? Where do they nest? Why do they nest in large groups, called colonies? How far do they migrate? Supplement the conversation with information from the Teacher Note on Bristol Bay seabird colonies and websites.
7. Tell the students that in the following activity they are going to be biologists, working for the Alaska Department of Fish and Game. They will survey a colony of nesting black-legged kittiwakes to determine whether it is a “good” year for eggs or a “poor” year. Black-legged kittiwakes generally lay zero to three eggs per season, depending on the available nutrient supply. During more productive years, when plankton and small fish are abundant, black-legged kittiwakes tend to lay a greater number of eggs.
8. To demonstrate the activity for the students, show the transparency of a portion of the black-legged kittiwake nesting colony to the students. Ask the students to look at the nests that hold the most chicks. How many chicks are in those nests? Now ask them to look at the nests that hold the fewest chicks. How many chicks are in those nests?
9. Have them count how many nests hold three chicks. Mark this number on the transparency of the chick tally sheet. Repeat for the nests that hold two, one, and zero chicks.

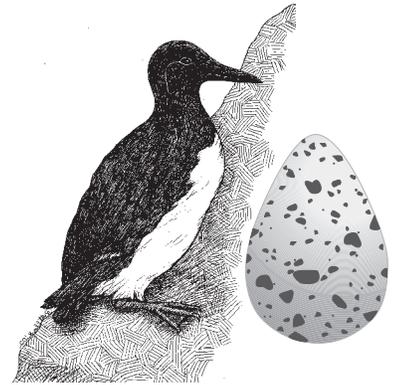


Fig. 3.1: Murre

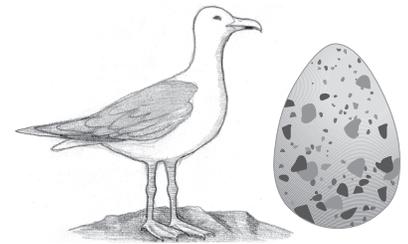


Fig. 3.2: Glaucous gull

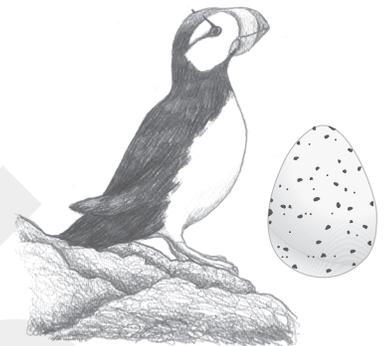


Fig. 3.3: Horned puffin

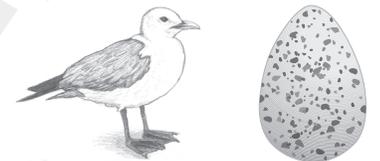


Fig. 3.4: Black-legged kittiwake

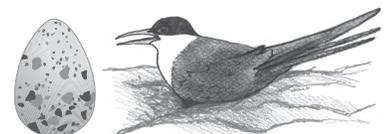


Fig. 3.5: Arctic tern

- Have students work in pairs. Distribute the handout on the entire black-legged kittiwake nesting colony and the chick tally worksheet to the students. Have them tally up the nests with three, two, one, and zero chicks.

Teacher Note

The difficulty students have with this activity is understanding that there are four categories of chicks and the number counted for each category may vary. Further, a 1 in the one-chick column has a different meaning than a 1 in the three-chick column. Encourage students to discuss and interpret the table.

| | | | | |
|------------------|---|---|---|---|
| Number of chicks |  |  |  |  |
| Number of nests | | | | |

Fig. 3.6: Chick tally worksheet



Fig. 3.7: Portion of black-legged kittiwake nesting colony

Assessment

Observe and check for understanding. Do your students understand that the numbers in the table reflect groups of chicks? For example, some students misunderstand a “3” placed in the column with 2 chicks. They may not understand that it represents 3 groups of 2 chicks or a total of 6 chicks.

- Observe their counting strategies. How do they keep track of the nests that have already been counted?
- Have students report their findings and discuss how they came to their answer. Have the students discuss the chick table and how to interpret it.
- Have the students discuss the following: What would the Alaska Department of Fish and Game say about their survey of the black-legged kittiwakes? Was it a good year? Bad year? Have the students discuss this and come to a consensus. Encourage students to support their findings.