

Details



Completion Time: Less than a week

Permission: Download and Share

Build a Krill!

Overview

This lesson introduces students to krill, their importance in ocean ecosystems, and the physical structures that make up the krill body. The students will then use the principles of a “floater” species and design their own krill, hopefully having a class competition to see who can build a better krill.

Objectives

Students will understand the importance of krill in an oceanic ecosystem. The students will also learn about the physical characteristics of krill as a floater species and then be able to design a new species.

Lesson Preparation

This is an excellent introductory lesson to oceanic food webs, and the importance of micro flora and fauna in ocean ecosystems. This lesson is also an excellent starting point prior to teaching about zooplankton and phytoplankton.

Procedure

DAY ONE: Students will learn about krill and their importance in an oceanic ecosystem. Review food webs and chains with oceanic species. Students and teacher will build an oceanic food web, with each student representing a different ocean species (Ocean Food Web Activity attached).

DAY TWO: Students will be introduced to the physical structure of a krill and will discuss its locomotion. This is also a time when you could introduce the concept of climate change (side lesson). Students will discuss as a class how krill move throughout the water column, as well as within the ocean ecosystem in which they live.

DAY THREE: Students will build a model of a krill. They will answer questions as to the krill's structure and ability

Materials

- Ocean Food Web Activity (attached)
- Krill handouts
- Pond, or water source to test new krill species
- Internet access
- Yarn
- Animal cards
- Assorted art materials for construction of new krill (balloons, pipe cleaners, sponges, string are just a few suggestions)

to adapt and survive but not be invasive.

DAY FOUR: Students will have a competition to see whose new krill species will be able to: float upright, be able to move within the water column and laterally across the surface.

Extension

- Class discussion on climate change and how an increase in ocean temperature can adversely affect krill, and in turn other oceanic species.
- Discussion on physical adaptations different species have to be able to survive in their unique ecosystems.
- Graph krill populations and how they are changing over time. http://commons.wikimedia.org/wiki/File:Antarctic_krill_catch.png

Resources

The following images can be either electronically displayed for student learning, or printed out for individual student use. All images and graphics were found on the Internet, with the sources cited.

Krill Images:

http://www.whoi.edu/annualreport02/highlights/globec_en3.html

<http://www.classroomatsea.net/JR161/about.html>

http://www.econguru.com/fundamentals_of_ecology/ecosystems.html

Additional Images:

<http://animals.nationalgeographic.com/animals/invertebrates/krill.html> (krill information)

<http://www.coolantarctica.com/Antarctica%20fact%20file/wildlife/krill.htm> (Antarctic krill)

http://en.wikipedia.org/wiki/Antarctic_krill (great krill facts)

Assessment

Students will be assessed on their ability to complete the ocean food web activity. There will be a grading rubric for the structure of their new krill species, and students will be asked to write a two paragraph summary on why the krill is such a vital part of ocean food webs, and hopefully include how climate change will adversely affect this species (through use of the extension).

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
- c. Organisms and environments

Content Standards, Grades 5-8

Content Standard C: Life Science

- a. Structure and function in living systems
- e. Diversity and adaptations of organisms

Ocean Food Web Activity

Each student will be given a card with the name of an oceanic plant or animal: The following list is a sample of some of the species you might wish to use.

Phytoplankton (lots of varieties)
Zooplankton (lots of varieties)
Krill
Walleye Pollock
Herring
Squid
Assorted fish
Seals
Small toothed whales
Sperm whale
Floating and sinking sediments
Clams
Walrus

Please remember you need more of the producers than of the top-level consumers. Make enough cards for everyone in the class. Please do not forget the sunlight card.

- Each student tapes an oceanic critter card to the front of his or her shirt.
- The students stand in a circle facing in so that everyone can see the others cards.
- The student with the sunlight card holds a ball of yarn and with one hand while holding the end throws the yarn to an ocean species that needs the sunlight to survive.
- The student who has received the yarn holds on to the yarn with one hand while throwing the yarn ball with the other hand to another student who either needs them to survive, or that they themselves need to survive.
- The yarn ball is then tossed from student to student until every learner has a hold of the yarn. The key to making this activity work is that the student can throw the yarn to anyone that **THEY** need to eat to survive, or anyone who needs to eat **THEM** to survive.

Each student should get the yarn only once, unless you are in a bind, and then can double up. If you have done the activity correctly the students should have made a yarn web in the center of their circle.

Discuss the importance of the krill with the students. Set up an unrealistic scenario in which all the krill have been killed and ask the student who is the krill to let go of the

yarn. Explain to the other students that as part of a food web, if you feel the yarn go slack in your hand then you have been adversely affected by the loss of the krill. That student also then lets go of their yarn. In a matter of moments the yarn is on the ground and no student is left holding the yarn except the sunlight.

This activity represents the interconnectedness of the oceanic ecosystem. If one species is adversely affected, so in turn will the other species.

Grading Rubric: Build a Krill

Project Criteria

	Possible points	Student points
Krill shows at least one form of locomotion		
Krill exhibits at least two body adaptations for survival		
Krill is able to float in artificial water source		
Krill has at least three original physical features		
Distinctive eye		
Exoskeleton		

Note: This is just a guide on developing a grading rubric for the final project.