

Creative Cleanup!



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Time: 60 minutes

Grade Level: Grades 4-6

Overview:

This activity introduces participants to the idea of conservation by teaching responsible behavior and community obligation to save marine ecosystems from harmful pollutants. This is a useful exercise to encourage preservation of natural marine habitats.

Rationale:

This lesson addresses the awareness to action model presented in the Tbilisi Declaration. Students will discover ways to make a difference in their community and learn a sense of responsibility in protecting marine habitats. In addition, the activity provided in this lesson plan will allow students to be “scientists for a day,” hypothesizing about possible dangers to marine habitats.

Oregon State Benchmarks Addressed:

Life Sciences

- CCG: SC.08.2.C.1(1) Identify and describe the factors that influence or change the balance of populations in their environment. *In this activity, students will understand that human waste has an effect on marine ecosystems.*

Earth Science

- CCG: SC.05.3.A.1(5) Recognize that discarded products contribute to the problem of waste disposal. *In this activity, students will learn that without a proper system of waste disposal, a variety of organisms will be affected negatively.*

Science Inquiry

- CCG: SC.05.4.A.1(1) Make observations. Ask questions or form hypotheses based on those observations, which can be explored through scientific investigations. *In this activity, students will ask questions as to where trash comes from, how it contributes to habitat destruction, and how to make a difference.*

Learning Objectives:

By the end of this activity, participants will be able to:

1. Define preservation.
2. Understand the effects of human waste on marine life.
3. Identify waste along the Oregon Coast. Identify what is not supposed to be there naturally.
4. Understand responsibilities of maintaining marine ecosystems. Students will understand how they can effectively preserve natural habitat.
5. Identify various marine organisms.
6. Turn trash into art.

Location:

This lesson plan is designed to be conducted on the beach at South Slough. It is particularly useful if there are too many students for the tide pools to handle at once, or for those students who are not engaging with the tide pools.

Materials Needed:

- Brown paper sacks for collecting trash
 - Laminated sign of a designated organism (one per student). If working with a larger group of students, they can work in pairs or groups with one organism per team.
- Example organisms are:

- Crab
 - Sea star
 - Anemone
 - Sea gull
 - Clam
 - Sponge
- Construction paper for post-activity
 - Glue sticks for post-activity

Background Material:

Humans have a devastating effect on marine habitat. We throw away trash and other materials that drift around the ocean, inevitably causing it to wash up on the country's rocky and sandy beach shores. The presence of such litter poses a threat to marine ecosystems. To preserve is to keep alive or to keep in existence. Children who understand the importance of preserving natural ecosystems go on to concern themselves with environmental issues, and strive to make a difference. Many marine species are threatened with increasing pollution; however this activity will focus on preservation of the following organisms' habitat. All organisms can be easily identified at South Slough:



- Dungeness crab: This species of crab have a wide, hard shell which they must split in order to grow. The Dungeness crab inhabits eel-grass beds and muddy to sandy bottoms, from the low inter-tidal zone to depths in excess of 600 ft. They can be found from the Aleutian Islands in Alaska to south of San Francisco.



- Sea Star: Sea stars in general are unmistakable animals that are made up of a round central disk and usually five radiating arms. This species grows up to a foot in diameter. The northern sea star is usually purple but may range from various shades of red and orange. On the underside of each arm is a groove that contains four rows of yellow tube feet, each one tipped with a suction cup.



- Anemone: A sea anemone usually attaches itself to rocks or coral. They have a central mouth which is surrounded by tentacles with nematocysts, stinging cells that paralyze and entangle small marine animals. Sea anemones look like plants, but they are really meat-eating animals.



- Sea Gull: They are typically medium to large birds, usually grey or white, often with black markings on the head or wings. They have stout, longish bills, and webbed feet. Most gulls are ground nesting carnivores, which will

take live food or scavenge opportunistically. The live food often includes crabs and small fish.

- Clam: Clams are animals that burrow under the sea floor. They are bivalves, mollusks that have two shells that protect a soft body. When a clam is threatened, most clams will pull their soft body into the shells and close the shells tightly for protection. The foot is used to burrow into the sand. Clams use their tube-like siphon to draw in water, from which they extract oxygen and filter plankton.



- Sponge: Most sea sponges attach themselves to coral, rocks or rock walls, shell beds and other hard or stable surfaces along the ocean floor. All sponges are commonly referred to as “filter feeders”, that is, they capture and digest bacteria, plankton, and other organic particulates floating in the water.

Activity Description:

Step 1: **Getting Started: Introduction** (5 minutes)

Once students have spent time in the tide pools (observing and identifying various organisms), take 1-2 minutes to gather a group of students for a beach sweep activity. Group should be approximately 5-6 students who want to “treasure hunt.”

Take 5 minutes to introduce self and pass out marine organism signs to students. Inform students to think about what life is like for their organism throughout the beach cleanup activity, and that there will be a discussion period after the activity that will involve their organism (if students do not know what their organism is, take 2 minutes to ask other students to help identify and name each others creatures – after 2 minutes, if students cannot name the species, name it for them, and provide a very brief background).

Step 2: **Beach Sweep Activity** (20 minutes)

Begin by telling students to search for any item along the beach or tide pools that is not a part of the natural habitat. In easier terms, tell participants to search for trash!

Set perimeter: Make sure you can see your participants at all times. Boundary lines should be marked by major landmarks such as rocks. They should be designated by the instructor’s comfort level. You must not allow students to wander off.

Students should not begin activity until facilitator is confident that children understand the rules and safety precautions as outlined below:

- Students must stay within designated perimeter.
- Rocks and Algae are slippery. Avoid or use extreme caution.
- Do not turn back on the ocean to avoid sneaker waves.
- Wear shoes to avoid stepping on rocks, glass, or other sharp objects.
- Use caution when picking up glass or other sharp objects.
- Do not run.

Encourage students to work together. Remind them that the activity is not a competition to see who can get the most trash.

Let students search.

After time is up, rally the students. Prepare to talk about their findings.

Step 3: **Discussion** (20 minutes)

One at a time, have the students take out their brown sacs with collected items, and present them to the group. (Each student should take 3-4 minutes to present). As the students are presenting they are discovering how each item can potentially harm the marine organisms hanging around their neck.

Example answers: *Please note the children are not limited to these answers.*

- Seabirds can easily get tangled up in netting, or find a colorful object and ingest it.
- Sponges and Clams rely on microscopic organisms such as phytoplankton. If phytoplankton dies due to changes in pH of the water, sponges and clams food will have less food to rely on.
- Anemones and crab could try feed on trash (mistaken for prey), accidentally ingesting harmful plastics or styrofoam.
- Sea Stars have the potential to get tangled in netting.

Actively participate in the discussion to encourage students to be creative with their ideas.

Spend time discussing ways they can prevent trash from piling up in the oceans and along the beaches. (Examples might be: placement of trash cans for accessibility, etc.). The goal is to help them understand that they can make a difference.

Step 4: **Wrap up and Post-Activity.** (Remaining minutes)

Bring it all together, summarizing key points and integrating threads so that a synthesis occurs. Return to the learning objectives and ask for a show of hands of those who feel they have been met. If they haven't been met, open it up to questions and comments.

Post Activity: Trashy Art!

This post activity is to prevent the students from throwing their trash back where they found it (reinforcing the idea that they can make a difference by disposing of trash properly)!

Students can gather in the learning center or in a pavilion (if outside is preferred). Hand them one glue stick and a piece of construction paper. Have them create a work of art consisting of the materials collected that day (they can also include the paper bag). Encourage creativity!

Additional Sources:

- Oregon Commission Report. "Reducing Marine Debris – Chapter 18" <http://www.aopmcri.org/com/article/oid/26/ht/human> February 11, 2005.
For more information on why it is important to preserve marine habitat, visit this website. Information briefly discussed in the background section of this lesson plan is found extensively on this site.
- Dungeness Community Website. "Dungeness crab." Dungeness Communications, Inc. <http://www.dungeness.com/crab/index.htm>
To learn more about Dungeness crab in the Pacific Northwest area, this site offers background and information about the particular species.
- Biomes Marine Biology Center. "Northern Sea Star: Learn it All." http://www.biomescenter.com/northernseastar_learn.htm
Visit this site to learn more about how sea stars function, what they eat, how they survive, and what conditions are ideal for the organism. One of the most identifiable organisms in tide pools, this website offers a brief synopsis of what life is like for this little creature.

- Goddard, Norma. "Welcome to Life in the Oceans: The Sea Anemone." <http://www.calstatela.edu/faculty/eviau/edit557/oceans/norma/osanom.htm> Aris Multimedia Entertainment, Inc. 1994.
The author of this site offers information on many marine organisms. She discusses sandy beach organisms, tide pool organisms, kelp forest species, and open sea creatures. This fascinating site is a great place to get a brief summary of a variety of creatures.
- Olsen, Klaus Malling & Larsson, Hans. *Terns of Europe and North America*. Christopher Helm, London. 1995.
Anything you would like to teach your students about the life of a seagull can be found in this book. From how the bird captures food to its shared existence with human beings, this book offers fun facts that can be used in various activities relating to the material in this lesson plan.
- EnchantedLearning.com.
<http://www.enchantedlearning.com/subjects/invertebrates/bivalve/Clamprintout.shtml> Copyright 1999-2007.
This website is ideal if wanting to discover various topics such as the anatomy of a clam as well as its diet. The site offers a brief history of this amazing tidal organism.
- "What are Sea Sponges – animals or plants?"
http://ctct.essortment.com/whatareseaspo_rkql.htm Copyright 2002.
Pagewise.

Sea sponges are one of the most fascinating creatures in tide pools according to this website. If you are looking for a brief yet informative website to learn a few sponge

