OIMB GK12 CURRICULUM

2nd Grade **45-60 minutes (can be 2 lessons)**

Marine Debris:
Getting Out of a Bind*
The Early Bird Gets the Plastic*

Oregon Science Content Standards:

- 2.1 Structure and Function: Living and non-living things vary throughout the natural world.
- 2.1L.1 Compare and contrast characteristics and behaviors of plants and animals and the environments where they live.

Ocean Literacy Principles:

- **6. The ocean and humans are inextricably interconnected**

Goals:

Through two games (one demonstrates an animal's entanglement in marine debris, the other demonstrates ingestion of marine debris), students will:

- Experience the negative effects that plastics can have on the feeding activities and health of marine animals.
- Consider the effects of plastic debris in the oceans and on the beaches from an animal's perspective.

Concepts:

- It is important that we do not litter as this garbage can make its way into the ocean.
- Marine debris is trash in the oceans: most of it is plastic.
- Marine animals are harmed by plastic trash in the oceans when they get tangled in it or eat it.
- Marine animals can get sick or starve when they mistake plastic trash for food.
- WE CAN MAKE A POSITIVE DIFFERENCE

Materials:

- One rubber band for each child
- A tray, shoe box, shallow box or similar for each group of 3-4 children
- Small pieces of plastic such as plastic foam pieces from packaging---1 Cup per tray
- Bird seed, beans, popcorn, etc --- 3 Cups per tray
- A spoon and paper cup for each child.

Lesson Plan:

Introduction: Before playing the games, introduce the topic of marine debris. Talk with the children about some of the animals in the ocean (e.g. birds, fish, turtles, marine mammals), and how they are affected by marine debris. (Refer to Teacher's Background.) It is important to emphasize that we can all take actions to make a positive difference.

Part 1: Getting out of a Bind

This activity teaches empathy for wildlife by simulating an animal's entanglement in plastic litter.

1. Use a volunteer to demonstrate. Put a rubber band around the back of his or her hand, catching the thumb and little finger
2. Hand out rubber bands for everyone to try. Tell each child to pretend his or her hand and arm is a seabird entangled in plastic. For example, the hand is its head, the fingers its beak and the forearm its neck. Cup elbow with free hand (to prevent use of free hand). Place rubber band as demonstrated. Have the children try to remove the rubber bands without using their other hand, teeth, face or other body parts. Allow children to try to free themselves. No helpers.
3. While the children are struggling, ask the class to imagine that they are seabirds that have gotten pieces of fishing line, abandoned net, or other debris wrapped around their beaks or necks. Tell them the birds would be unable to eat until they got themselves free. Ask them the following questions:
    - How would you feel after struggling like this all morning?
    - How would you feel after missing breakfast?
    - What would happen if you continued to miss meals and spent all of your strength fighting to get free?
    - What would happen if a predator was chasing you?
4. Encourage students to share their thoughts and feelings about being entangled. Remind them that their experience is similar to that of a bird or other marine animal that becomes entangled in debris.
5. Is everyone successful in untangling themselves? Many animals don't get free, of course, and starve, strangle, or suffocate.
6. Discuss the following with the children. What plastics or other material could the rubber band represent in a natural setting? (Fishing line, plastic six-pack rings, fishing net, packing straps.) How could an animal get into a situation in which these materials would entangle it? (By swimming into plastic accidentally. Also a bird might eat the bait on a fishing line, then become entangled or take the line back to a nest of babies.) Some students might have rubbed their hand against the table to remove the band. In the marine environment, what would animals rub their heads against? (A rock, dock, floating

log.) What might happen to an animal that rubbed its head against a rock until the band came off?

Part 2: The Early Bird Gets the Plastic

This activity helps children understand how animals can mistake plastic for food.

1. The object of the game is to collect as much food as possible in the short time allotted. Because of the collection method and the short time allowed, some plastic will also be gathered.
2. In each tray, mix plastic pieces with bird seed or popcorn. Have 3-4 children "feed" at each tray for 30 seconds, using spoons as beaks. Each child should place the spoonfuls of food into his or her own paper cup that represents their "stomach". When time is up, the children will empty their "stomach cups" onto the tables and examine their piles for real food and plastic. Help the children count and record the pieces in two columns on a sheet of paper. (This can be done as class totals on the board.)
3. Have the students keep the plastic pieces in their "stomach-cup", but return the food pieces to the tray. (This represents the undigested plastic staying in the stomach.)
4. Begin the feeding exercise again. Remind the students that they are to gather as much as possible in the short time.
5. Ask the children what they think will happen to birds that eat plastic. (Since plastic is difficult to digest, it can build up in the birds' stomachs taking the place of real food. The birds weaken and could starve.)

Wrap Up: Talk with the students about how they can make a positive difference to reduce marine debris and keep animals from getting entangled in or eating plastic. Brainstorm ideas. Include: not littering, use less plastic, beach clean-ups, teaching others..

Assessment:

Ask your students what kinds of trash represent a danger to marine animals, and how they harm marine animals. Where does this trash come from? How can they make a positive difference to reduce marine debris?

Teacher Background:

Marine animals can be harmed by plastic litter. Marine mammals, birds, and fish can become tangled in plastic fishing line, plastic strapping bands, six-pack rings, plastic bags and bottles, or other plastic trash that ends up in the oceans. Once entangled, animals have trouble eating, breathing or swimming, all of which can have fatal results. They spend energy trying to get free, may become sick or weak, and even die. Plastics take many years to breakdown and may continue to trap and kill animals year after year.

Certain marine animals also mistake plastic for food. Sea turtles mistake plastic bags for jellyfish, one of their favorite foods. Birds sometimes mistake plastic pieces for fish eggs and other food. Some birds even feed plastic pieces to their young. Gray whales have been found dead with plastic bags and sheeting in their stomachs. With plastic filling their stomachs, animals have a false feeling of being full, stop eating and may die of starvation.

This deadly trash is known as marine debris. It is trash found in the ocean or along its shores. Its source can be classified as either "ocean-based" or "land-based", depending on where it enters the water. Ocean-based debris is waste disposed of in the ocean by ships. Land-based debris, on the other hand, is debris that blows, washes, or is discharged into the water from land.

Humans are also harmed by beach debris. Beachgoers can cut themselves on glass and metal left on the beach. Marine debris also endangers the safety and livelihood of fishermen and recreational boaters. Nets and fishing line can obstruct propellers and plastic sheeting and bags can block cooling intakes. Such damage is hazardous and costly in terms of repair and lost fishing time.

Some of our pollution problems are problems of misplaced resources. For every item we recycle or reuse, that's one less piece of trash that can become a part of the marine debris cycle threatening people and wildlife.

The debris that we collect from our beaches is a symptom of a much larger water pollution problem that is caused in part by sewage and industrial discharges, but also by everyday people doing every day things. Rain washes oil from roads and parking lots, fertilizer and pesticides from fields, animal droppings and other contaminants from "nonpoint" sources and transports this into the ocean. We can all be part of the solution by recycling, not littering, and switching to non-toxic products and improving other everyday practices to help keep our water clean.

***Sources:**

Center for Marine Conservation and the California Coastal Commission. 1993. Save Our Seas, A curriculum for Kindergarten through the Twelfth Grade.

EPA. 1992. Turning the Tide on Trash, A Learning Guide on Marine Debris.