

OIMB GK12 CURRICULUM

2nd Grade

30-45 minutes

WAVES

Oregon Science Content Standards:

2.3 Scientific Inquiry: Scientific inquiry is a process used to explore the natural world using evidence from observations.

2.3S.1 Observe, measure, and record properties of objects and substances using simple tools to gather data and extend the senses.

2.3S.2 Make predictions about living and non-living things and events in the environment based on observed patterns.

Ocean Literacy Principles:

2. The ocean and life in the ocean shape the features of the Earth.

Goals:

- To show students how waves travel across water
- To teach students the difference between waves in deep water and waves in shallow water.
- To help students understand how waves bring abiotic and biotic material up onto the beach.

Concepts:

- Waves are made when energy goes into water. The most common sources of this energy are wind and moving things.
- Waves in deep water are different from waves near the shore. Waves get taller and break when they reach shallow water because they begin to rub against the bottom.
- When waves break near shore, they often carry objects (both living and not) from the water and leave them on the beach.

Materials:

- Jump rope
- Tubs (one per group)
- Rocks (one per group)
- Corks (one per group)
- Straws (one per group)
- Water for the tubs
- Container of items collected at a sandy beach: seaweed, shells, and trash

Lesson Plan:

1. Lead a discussion with students to see what they already know about making waves, what waves are like, and what waves can do. Make a list on the board as the students come up with their ideas. Good discussion questions include:
 - What makes waves?

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- Are waves different in the middle of the ocean than on a sandy beach?
 - Have you ever seen a wave leave something on the beach?
2. Using a jump rope and a few student helpers, demonstrate how waves move through water and how waves in deep water differ from those in shallow.
 - Waves in deep water don't run into the bottom of the ocean, so they stay the same size and shape as they travel (shake the rope up and down, making bumps). One would pass right under your boat, and you would only bob up and down a bit.
 - What happens when you put a little more energy into it (shake the rope faster)?
 - As a wave approaches the shore, the bottom of the wave begins to rub against the seafloor. This slows the bottom of the wave down, but the top part of the wave is still going fast. This makes the wave unbalanced (top-heavy) and it "breaks" on top of itself. Use your hands or an object to increase friction on the bottom of the waves on one side of the rope and have the students observe what happens.
 3. Separate students into groups and give each group an empty tub, a container of water, a cork, a straw, and a rock. Let the students know that they are not at any time to splash the water. Tell them that the tub of water in front of them represents their own little "ocean," and that today they will be making waves in the ocean.
 4. Have the students drop the rock into the water and watch waves form. Have them place the cork on the water and drop the rock into the water and watch what happens to the cork. Next, have them use straws to blow on the water to make waves.
 - Note: as an alternative exploration activity, you may want to give less direction at the beginning. Simply tell the students that their job is to make waves using the tools they were given and without using their hands or splashing. It is more chaotic this way, but most students enjoy it more and the act of discovery often makes more of an impression.
 5. Discuss and make a list on the board of what the students did to make waves in their own little "oceans." Ask what each action may represent in the real ocean (example: blowing through straw is like wind). Ask the students if they noticed what happened to the floating cork as the waves moved around it.
 6. Ask students if they have ever found something interesting on the beach. Discuss where these items might have come from. Tell students that waves often wash items up on the shore and then leave them there. Pull out items collected at the sandy beach and discuss the positive and negatives of each item.
 7. If time allows, have students draw how they made waves, the difference between waves in deep and shallow water, and waves leaving things on the sandy beach.

Assessment: Class discussion and drawings.

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