

Hawaiian Islands Humpback Whale National Marine Sanctuary

“Oceanography 101”

Grade Level: 4-8

Timeframe: 45 Minutes

Materials:

Salts

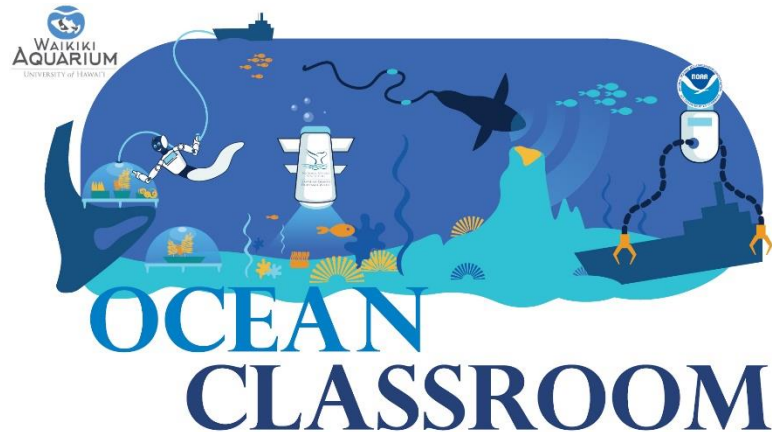
- Pie-tins to hold salt water samples
- Location in the sun to leave containers for water evaporation
- Different samples of sea water

Currents: (for each group)

- Two jars or glasses with the same size mouth
- Containers of hot and cold water
- Dishpan or pie-tin to catch the spilled water
- Index cards or a piece of card stock
- 1/4 cup of salt
- Two colors of food coloring

Key Words

- **Hydrothermal vents:** An opening in the sea floor from which minerals and salts can flow. Hydrothermal vents are often found by underwater volcanoes.
- **Current:** A stream of water that moves continuously through a body of water. Currents can be caused by changes in salinity and temperature.
- **Waves:** Winds create waves. The faster the wind, the bigger the wave. Waves can also be caused by underwater volcanoes or landslides.



Lesson Summary

Oceanography 101 looks at physical characteristics of the ocean and how these can influence the different ecosystems. The lesson will give teachers hands on activities to help students understand, what causes waves, what causes currents and what makes the ocean salty.

Learning Objectives

- Students will be able to list two sources of salt in the ocean.
- Students will be able describe what causes waves.
- Students will be able to explain and demonstrate what makes currents.

Background Information

The ocean water has characteristics that influences what organisms can live where. The temperature, salinity, pressure and currents are some of these characteristics. Animals need to be able to adapt to the conditions of their ecosystem. A good example are animals that live in tide pools. The salinity and temperature can change as the water in the shallow pools evaporates and then rises again as the tides come in.



Place a dishpan or a large aluminum pan under the jars to catch the spilled water. Have the students make their own currents. Encourage them to try different combinations of cold and hot water, salty and fresh water, cold salty and warm water etc. Have them create a chart to record their different combinations and what happened. Share the best results from the different groups. Conclude the lesson with a discussion of the positive and negative affects the currents can have on marine life.

Procedure

Introduction: Have students compile a list of characteristics of the physical ocean. How might these things affect the animals that live in the ocean?

Ocean Salts: Have students brainstorm ideas about how salt might get into the ocean. Collect different samples of ocean and brackish water. Place equal amounts of each type of water into aluminum pie pans. Place these outside in the sun to evaporate the water. Challenge students to find a way to measure and compare how much salt is left behind.

Ocean Waves: Play and discuss the video from the Ocean Classroom program about hydrothermal vents and tsunamis. Discuss what causes tsunamis and how they are different from surface waves.

Ocean Currents: Play and discuss the video from the Ocean Classroom about currents. Have students write or draw examples of currents in the ocean and where they come from. Demonstrate how to create a current. Use glasses or jars that are the same size (the smaller the mouth the better). Fill both jars with water. Add two tablespoons of salt and a drop of food coloring into one of the jars and stir. Place an index card on of the jar with salt in it and invert it over the plain water jar. Line up the mouths of the jars. Slowly pull the card away allowing the water to mix in the jars. You should see a stream of colored water flow from one bottle to the other. Discuss what happens and why.

For More Information

Check out the Hawaiian Islands Humpback Whale National Marine Sanctuary's web site <http://hawaiianhumpbackwhale@noaa.gov>, for more information about the sanctuary and teacher and student pages for more activities