

Characteristics of Waves ▪ *Skills Lab*

Making Waves

Problem

How do water waves interact with each other and with solid objects in their paths?

Skills Focus

observing, making models

Materials

water

plastic dropper

metric ruler

paper towels

modeling clay

cork or other small floating object

ripple tank (aluminum foil lasagna pan with mirror at the bottom)

Procedure *Review the safety guidelines in Appendix A.*

1. Fill the pan with water to a depth of 1.5 cm. Let the water come to rest. Make a data table like the one shown in your text.
2. Fill a plastic dropper with water. Then release a drop of water from a height of about 10 cm above the center of the ripple tank. Observe the reflection of the waves that form and record your observations.
3. Predict how placing a paper towel across one end of the ripple tank will affect the reflection of the waves. Record your prediction in your notebook.
4. Drape a paper towel across one end of the ripple tank so it hangs in the water. Repeat Step 2, and record your observations of the waves.
5. Remove the paper towel and place a stick of modeling clay in the water near the center of the ripple tank.
6. From a height of about 10 cm, release a drop of water into the ripple tank halfway between the clay and one of the short walls. Record your observations.
7. Place the clay in a different position so that the waves strike it at an angle. Then repeat Step 6.
8. Place two sticks of clay end-to-end across the width of the tank. Adjust the clay so that there is a gap of about 2 cm between the ends of the two pieces. Repeat Step 6. Now change the angle of the barrier in the tank. Again repeat Step 6, and watch to see if the waves interact with the barrier any differently.

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Making Waves *(continued)*

9. Cut the two pieces of clay in half. Use the pieces to make a barrier with three 2-cm gaps. Then repeat Step 6.
10. Remove all the clay and add a small floating object, such as a cork, to the water. Then repeat Steps 2–9 with the floating object. Observe and record what happens to the cork in each step.
11. Once you have finished all of the trials, clean and dry your work area.

Data Table

Type of Barrier	Observations Without Cork	Observations With Cork

Characteristics of Waves ▪ *Skills Lab***Analyze and Conclude**

Write your answers on a separate sheet of paper.

1. **Observing** How are the waves affected by the paper towel hanging in the water?
2. **Observing** What happens when the waves strike a barrier head on? When they strike it at an angle?
3. **Observing** What happens when the waves strike a barrier with a gap in it? With three gaps in it?
4. **Making Models** What did the paper towel represent? What did the cork represent?
5. **Applying Concepts** How does the behavior of waves in your model compare to the behavior of waves in a harbor?
6. **Communicating** Evaluate your model. Write a paragraph about the ways your model represents a real situation. Then write a paragraph about your model's limitations.

More to Explore

Predict what would happen if you could send a steady train of uniform waves the length of the tank for an extended time. Use a plastic bottle with a pinhole in the bottom to make a dropper that will help to test your prediction. Get permission from your teacher to try out your dropper device.