

Wind Waves

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Objective

To investigate the factors affecting wind waves.

Materials

- Hair dryer
- A small glass or plastic rectangular container (such as an aquarium)
- Ring stand (to hold and position hair dryer)
- Erasable markers
- Ruler
- Water
- Tape
- Clock or watch

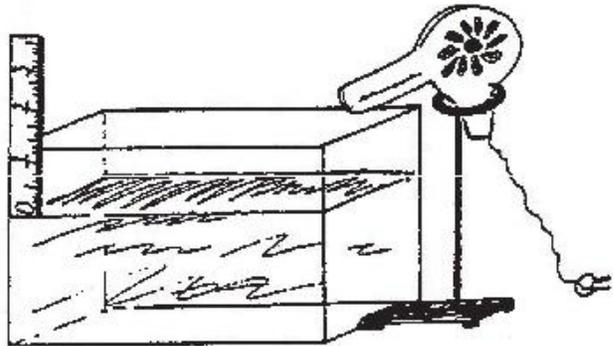
Safety note: *do not let any part of the dryer touch the water!!!*

Background Information

See the [Waves Fact Sheet](#).

Procedure

1. *Setting up the experiment.* Place the container on a firm, level surface.
2. Fill the container until it is approximately three-fourths full with water.
3. Tape a ruler on the outside of the container such that the zero mark is at the level of the water's surface.
4. Place the ring stand opposite the side of the container with the ruler. Set up the hair dryer on the stand such that it is a few inches above the water. *Make sure the dryer does not touch the water.*
5. *Comparing waves.* Mark the position of the still water's surface using erasable marker



along the side of the container and label it accordingly.

6. For each of the different speed settings of the hair dryer:
 1. Start the hair dryer. Record observations about the the initial set of waves.
 2. After 3 minutes, mark and label the maximum height of the waves using erasable marker on the side of the container. Calculate the difference between this maximum height and the still water's height. Describe the shape of these waves.
 3. Repeat Step 2 but let the hair dryer run for a total of 5 minutes.
 4. Describe what happens to the waves as the hit the sides of the container.
 5. Turn off the hair dryer and let the water settle again.

Observations

	Low Speed	Medium Speed	High Speed
Description of original waves			
Description of waves after 3 minutes			
Height of waves after 3 minutes			
Description of waves after 5 minutes			
Height of waves after 5 minutes			
Description of what happens to the waves as they strike the end and sides of container			

Analysis

1. What is the relationship between the height of a wave (distance from crest to trough) and the position of the crest above the still water level?

2. How is the wave height affected by the length of time the wind blows?
3. Describe how the force or strength of the wind affects the height of the waves.
4. What happens to the waves when they hit the end and sides of the container?
5. Does the strength of the waves have any effect on this movement of the waves? Explain your answer.
6. Compare the behavior of the waves that reach the end of the container with those that reach the sides.
7. If your container was twice as long, what effect do you think this extra length would have on the behavior of the waves? (If a larger container is available, try it and see!)

Conclusion

Explain how this investigation demonstrates the factors that affect wind waves and explain how these factors affect the height of the waves.