

Making Waves

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Objectives

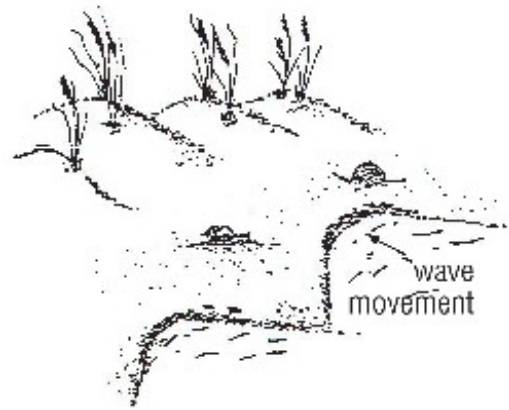
1. To investigate the effect of wave action on a beach.
2. To investigate the differences between summer and winter waves.

Materials

- A shallow, rectangular container (for example, an aquarium)
- A block of wood
- Sand
- Erasable markers
- Container of water

Background Information

Ocean waves are continually shaping and reshaping the shoreline. Every wave that rolls up onto the beach carries sand with it. When they recede to the ocean, waves carry sand back with them as well. In the winter, stronger winds produce bigger, stronger waves, which can remove more sand from the beach than they deposit on the beach (a process known as *erosion*). The sand that is removed is deposited in offshore sandbars. During the summer, the waves are gentler and carry sand from the offshore sandbars and deposit it back onto the beach. The strong backwash of winter storm waves leaves the beach with a steeper slope than the summer waves, which create a more gradual slope.



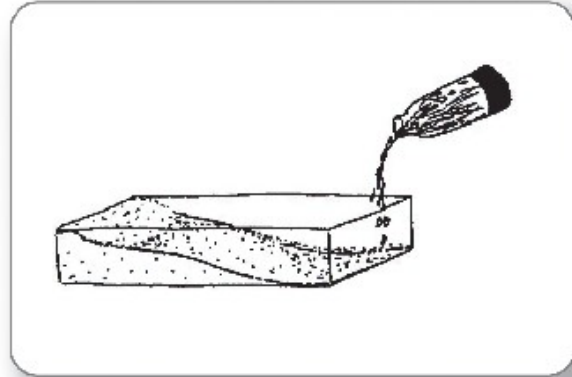
Also see the Waves Fact Sheet (on the SECOORA website).

Procedure

1. Add sand into the rectangular container to simulate a beach. The beach should occupy roughly one-half the container (see the illustration on the next page). Be sure to create a slope to simulate a real beach.

2. Outline the profile of the beach along the side of the container using an erasable marker. Be sure to label the outline "Original Beach outline." Draw this outline in your data table.

3. Slowly pour water into the container on the side opposite the beach. Be sure not to disturb the sand too much by pouring too quickly.



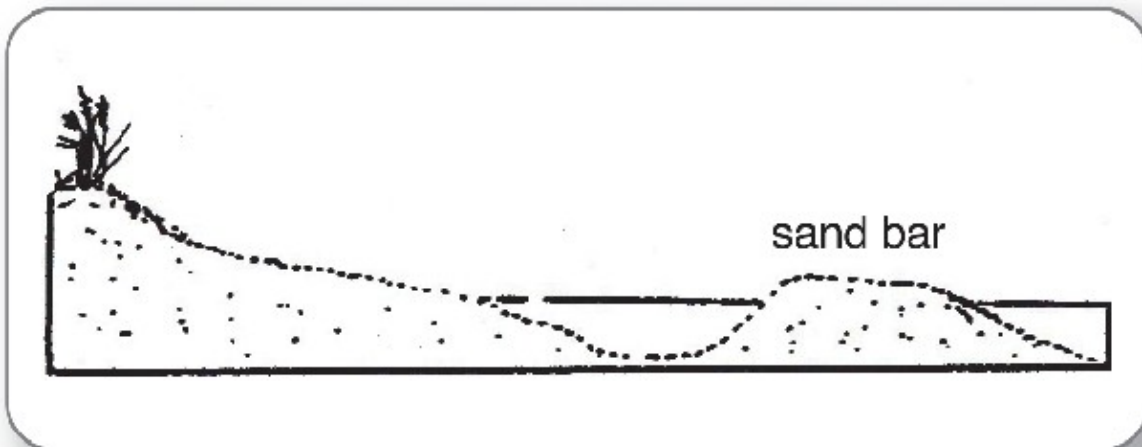
4. Use the block of wood to create strong waves (simulating winter waves). Do this for several minutes until about half of the sand has been removed from the beach. Record your observations about the new state of the beach.

5. Repeat Step 2 for the new outline of the beach. Label this new outline "Beach after winter waves."

6. Use the block of wood to create gentle waves (simulating summer waves) for several minutes. Record your observations.

7. Repeat Step 2 for the new outline of the beach. Label this new outline "Beach after summer waves."

8. Create a new beach and include a sandbar (see the illustration below) and repeat Steps 4–7 for this new beach.



Observations

	Description of beach	Drawing of beach profile
Original beach		
Beach after winter waves		
Beach after summer waves		

Analysis

1. What happened to the sand on the beach after the influence of the stronger winter waves? Where did the sand go?
2. What happened to the beach after the influence of the gentler summer waves? Where did the sand go?
3. Did you notice any evidence of the formation of an offshore sandbar? If so, where did it begin to form?

Conclusions

Describe the effect of wave action on a beach.

Explain the differences between what happens to the sand under the influence of summer waves and what happens with winter waves.