

Making Waves

Little waves can have a big effect on swimmers in the pool!

Collect

- 2 shoebox-sized plastic bins
- 1 larger plastic bin that one smaller bin can fit inside
- Water
- 2 palm-sized rocks, similar in size and weight
- String (optional)
- Circular materials like bottle caps, cardboard disks, and pool noodle pieces (optional)



How does the size help

1. Fill one smaller bin about halfway with water.
2. Place the other small bin inside the larger bin. Fill the empty smaller bin with water, almost to the point of overflowing.
3. Hold a rock just above the top of the half-filled container and drop it in. Observe the ripples that form and watch how they travel through the water.
4. Hold a rock just above the top of the full container and drop it in. Observe the ripples that form and watch how they travel through the water.

What's happening?

Waves are the transfer of energy through a medium. When a swimmer moves through the water, they create waves with each stroke or kick. During an Olympic race, lots of swimmers are in the pool creating waves all at once. Engineers have to work hard to design a pool that prevents these waves from interacting with other competitors.

What's the sports connection?

Did you notice a difference between the two sets of ripples? An Olympic pool is about 8 feet (2.5 meters) deep and 82 feet (25 meters) wide. The deeper and wider the pool, the more space there is for the water to keep moving away from the swimmers before hitting anything and splashing back. Olympic pools also have special drainage troughs around the edge. Any waves that make it to the edge slosh over instead of reflecting back into the pool, just like the water that splashed over the edge of the full bin of water.

Take it further!

Some pools have a floating lane divider that separates the swimmers from each other. Each plastic disk on the divider is designed to spin when a wave hits it. That way, the disks absorb the wave instead of letting it travel through the water.

Thread the circular materials onto a string to create your own lane divider. String it across the full bin, and then test your design with the rocks again. Can you design a divider that helps dampen the ripples created by the rocks?

