

Activity Guide: Making Waves (Part One)

Purpose: Visualize wave forms with ropes.

Museum Connection: We are curious, creative and playful!

Main Idea: Some kinds of energy travel in waves. Here's a way to visualize them.

Background Information for Educator: Some types of energy, like sound and light, travel in waves. One kind of wave, transverse, can be modeled using ropes. As the rope is wiggled back and forth, the amplitude (height), wavelength, and frequency can be varied and the relationship between them can be visualized.

Sources: <https://thescienceofwaves.weebly.com/parts-and-types-of-a-wave.html>

Prep (Time): 5 minutes to gather supplies

Materials:

| Item | Quantity |
|-------------------------------------------------------------------|----------------------------------------|
| 6ft rope (could be jump rope, cotton rope, even spring or slinky) | As many different ones as can be found |

Talking Points:

- Use the chart below to identify the parts of a wave: crest and trough. Also identify the wavelength (the distance between two adjacent crests) and the amplitude (the height of the wave over the neutral point).
- When following the Step-by-Step Instructions below, ask the following questions:
 - What happens to the wavelength when the frequency changes?

The frequency is created when one person moves their hand back and forth to create the wave motion in the rope, slinky, or spring. Is their hand moving fast or slow? What happens to the distance between two crests when they move their hand fast? Repeat with a slow moving hand.

- What happens to the amplitude when the frequency changes?

When the rope, slinky, or spring is laid in a straight line between the two participants, that is an amplitude of zero. When one person begins to move the rope back and forth to make a wave, the distance from the zero

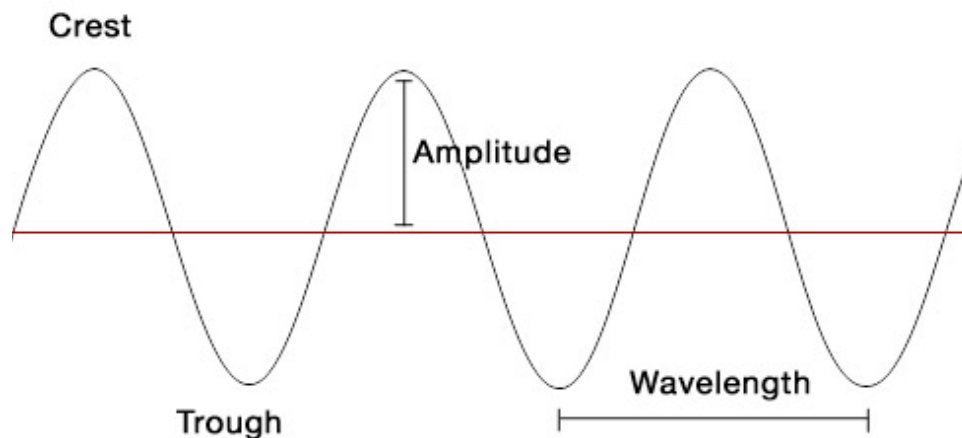
point to a crest is the amplitude. If you are outside, you can use chalk to mark the zero and the crest of the wave to see the amplitude.

- If you have more than one material for making waves, observe if the waves different in different materials. Why is this?

Step-by-Step Instructions:

1. Two partners sit on either end of the rope which is resting on the floor.
2. Each partner takes turns starting the wave by moving their hand from side to side.
3. Experiment by moving your hand faster and slower and by making bigger movements.

Picture of Final Project:



www.thescienceofwaves.weebly.com