

Making Waves

Name _____ Date _____ Class _____ EN _____

In this activity you will be observing water waves. Before you do the activity, define the following terms:

Vocabulary:

1. Amplitude _____
2. Wavelength _____
3. Frequency _____
4. Period _____
5. Speed _____

Procedure:

Part 1: Observing waves

1. Generate a wave in the tub and observe how the wave travels.
2. Make a wave with a larger amplitude and observe how it travels.

Part 2: Average speed

1. Lightly tap the surface of the water with a pencil on one side of the tub and watch the waves travel to the other side of the tub.
2. Measure the distance from where you will tap the water (point A) to the other end of the tub (point B)
3. Time how long it takes for one wave to travel from point A to point B. Do this 3 times and then calculate the average time.
4. Calculate the average speed of the wave. **Average Speed = distance ÷ time**
5. **Tap the water once every second and time how long it takes for the first wave to travel from point A to B and the third wave to travel from point A to B. Repeat 3 times and calculate the average.**
6. **Tap the water every ½ second and time how long it takes for the first wave to travel from point A to B and the third wave to travel from point A to B. Repeat 3 times, calculate the average.**

Part 3: Frequency and Wavelength

1. Tap the water at a consistent rate for 10 seconds and count the number of taps = # waves
2. Calculate the frequency of the waves. **Frequency = #waves ÷ # seconds**
3. Estimate the distance of the wavelength with a ruler.
4. Calculate the wavelength. **Wavelength = speed ÷ Frequency**
5. Repeat steps #5-7, but tap at a faster rate.

Data:

Part 1:

Observations: _____

Part 2: Average Speed

Distance from Point A to Point B _____ cm

	Trial 1 (sec)	Trial 2 (sec)	Trial 3 (sec)	Average time (sec)	Average Speed (cm/s)
Average speed					
1 wave/sec Wave 1					
1 wave/sec Wave 3					
1 wave/ 0.5sec Wave 1					
1 wave/ 0.5sec Wave 3					

Part 3: Frequency and Wavelength

Slower Rate

Trial	# Waves	Time (sec)	Frequency Waves/sec	Period Sec/wave	Estimated wavelength	Speed	Actual Wavelength
1							
2							
3							

Faster Rate

Trial	# Waves	Time (sec)	Frequency Waves/sec	Period Sec/wave	Estimated wavelength	Speed	Actual Wavelength
1							
2							
3							

Questions:

Part 1

1. From your observations, how did the wave energy travel?
2. How can you increase the amplitude of a wave?

Part 2

3. What is the relationship between speed of a wave and the frequency?
4. When you increase the frequency, what happens to the speed?
- 5.

Part 3

6. How is the period related to the frequency of a wave?
7. How does the wavelength change when you increase the frequency?

Overall

8. What will determine the speed of a wave?