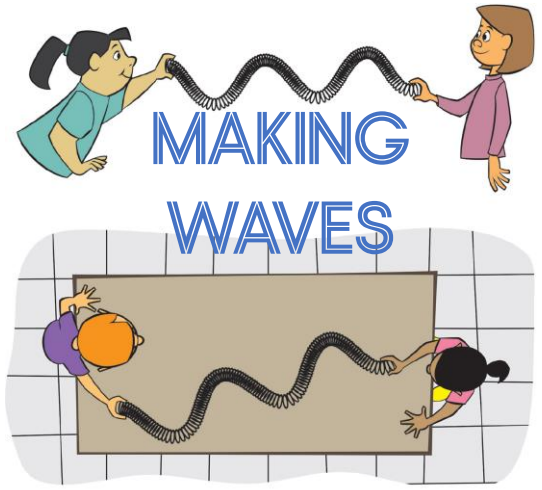
Making Waves
Calculating Mechanical Wave Speed



INTRODUCTION: **Waves are vibrations that** carry energy from place to place. Some waves travel extremely fast, like light. However, light waves are special as they don't have to move through matter to carry their energy. However, **mechanical waves**, like sound or waves moving through water, require matter to carry energy. The matter waves travel through is called a **medium**.

Mechanical waves can be transverse or longitudinal. Transverse waves are perpendicular to the direction of travel, while longitudinal waves are parallel to the direction of travel. As a result, transverse have high wavelength (length between waves) and low frequency (# of pulses) , while longitudinal have low wavelength and high frequency. See the picture.

Wavelength (**λ**) can be calculated by divided wave speed (v) by frequency (f)

λ = v / f
λ = wavelength
v = wave speed
f = frequency

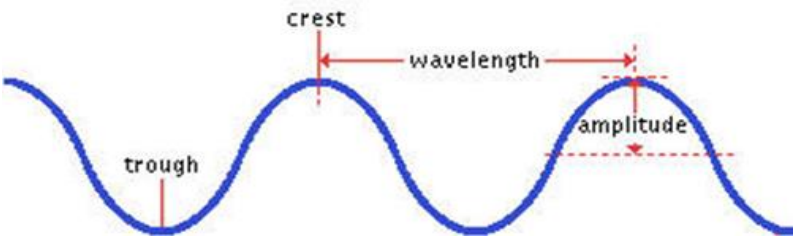
PROCEDURE:

1.Take the slinky and stretch out to one meter (If you are doing this alone, find a way to secure it at the other end)
2.Send one pulse down the slinky by moving your hand up then down very quickly
3.Time how long it takes for the pulse to reach the end.
4.Calculate the wave speed using Distance/time & record in your table.
5.Calculate the wavelength & record it.
6.Repeat steps 2 & 3, but increase the # of pulses down the slinky (at least up to three)

MATERIALS RECEIPT
PRICES ARE APPROXIMATE

Slinky	$4.00
Meter/Yard Stick	$3.00
Timer (Phone)	N/A
Calculator (Phone)	N/A
TOTAL	$7.00

# of Pulses	Distance (m)	Time (s)	Wave Speed (m/s)	Wavelength (m)
1	1			
2	1			
3	1			



LET'S APPLY

1.Were the waves you created transverse or longitudinal?
(Think of the way you moved your hand and the direction the wave traveled)

2.What happened to wave speed when you increased the frequency? Why do this make sense?

3.Examine your data, how is Frequency related to Wavelength? Cite evidence from your data