**Part A: How do waves change upon entering a different medium**

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λ=2.0m

1. Have the students practice walking at a constant pace towards the line that you define as the medium change. Students representing each wave crest should be holding a rope or metre sticks to ensure they move together. As the students cross the line that represents the medium change they should move to heel-toe walking. Record wavelength in the slower medium.
2. Calculate the ratio ( in decimal form) of the wavelength in the first medium to the wavelength in the second medium.

Ratio:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Repeat the experiment but measure distance and time for the waves in both media and use these to calculate the speeds of the waves.
2. Calculate the ratio ( in decimal form) of the wave speed in the first medium to the wave speed in the second medium.

Ratio:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Compare the wavelength ratio to the speed ratio.
2. Reverse the direction of the wave (go from slow to fast) so that the students can see that everything is consistent ( no measurements required )

**Part B: Refraction**

1. Repeat step 1 in the first part but make sure the waves strike the interface between the media at an angle as shown below.

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1. Use a rope or metre stick to mark the direction of the waves in both media.
2. Measure the angle of incidence and angle of refraction in both media.

angle of incidence \_\_\_\_\_\_ angle of refraction \_\_\_\_\_

1. Take the ratio of the sine of angle of incidence and sine of the angle of refraction for both steps 3 and 4.

Ratio:\_\_\_\_\_\_\_\_

1. How did the ratio relate to the wavelength and speed ratios from Part A
2. Repeat step 3 but with the wave going from the slow medium to the fast medium. (no measurements are required)

**Challenge**

How could you use this to show

1. Dispersion?
2. Total internal reflection?