

WJEC Wales Physics GCSE

SP1.5: Water Waves

Practical Notes

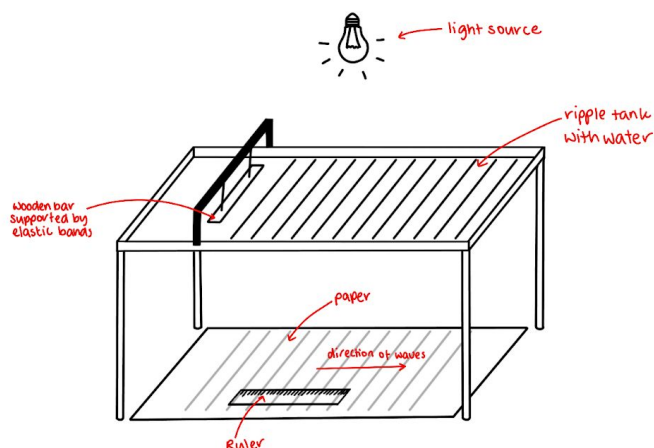


Investigation of the speed of water waves

Equipment

- Ripple tank
- Ruler
- Camera (or phone)
- Stopwatch

Diagram



Method

1. Set up the ripple tank and place a piece of paper and a ruler underneath the tank where the light and shadows of the waves are visible.
 - The ruler must be perpendicular to the wavefronts – you can ensure this by using a set square or anything with a 90° corner.
2. Make the waves as slow as they can be whilst still being clearly visible.
3. Use the ruler to measure the wavelength of the waves.
 - It may be helpful to take a photo of the waves with the ruler in the picture so that you can take your measurements without the waves moving.
 - Remember the value for the wavelength must be in metres, not centimetres.
4. Use the stopwatch to time 10 seconds and count the number of wavefronts that pass a fixed point in that time (mark the point on the paper to make this easier). Divide this number by 10 to obtain the **frequency** of the waves.
5. Mark two points beneath the tank that are a set distance apart (e.g. the length of the ruler, 0.3 m) and use the stopwatch to determine the time it takes for one wave to travel between the two points.
6. Using the formula $v = f\lambda$, you can calculate the value for the speed of the wave obtained through the wavelength and frequency of the wave.
7. Using the formula $v = \frac{d}{t}$, you can calculate another value for the speed of the wave obtained through the time it took to travel the distance you marked on the paper.
8. Compare the two values for speed. If they are similar, this method can be deemed a suitable investigation.

