

# Required Practical Waves

GCSE Physics · Written to the shared content for AQA, Edexcel and OCR

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

## 1. Worked example

**In a ripple tank, 10 complete wavelengths (11 bright crest lines) span 15 cm on the paper below. Calculate the wavelength. (2 marks)**

Step 1 · Why use 10 waves

One wavelength is too small to measure accurately; measuring across 10 and dividing reduces the uncertainty.

Step 2 · Calculate

$$\lambda = 15 \div 10 = 1.5 \text{ cm} = 0.015 \text{ m}$$

**Answer: 1.5 cm (0.015 m)**

Check: Count gaps between crests, not crests: 10 wavelengths need 11 crests.

## 2. Now try one with the steps

**The ripple tank's paddle vibrates at 12 Hz and the wavelength is 0.015 m. Calculate the wave speed. (2 marks)**

Step 1 · Equation

Step 2 · Calculate

**Answer:**

## 3. Practice

Show your working. The marks tell you how much is expected.

**1.** Describe how to measure the wavelength of ripples in a ripple tank. [2]

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**2.** Describe how to measure the frequency of the ripples. [2]

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**3.** The shadows of 10 waves span 15 cm. State the wavelength. [1]

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4. Explain why a lamp is placed above the ripple tank. [1]
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5. Give one safety precaution when using a ripple tank. [1]
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6. Give one safety precaution for the waves-on-a-string experiment. [1]
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7. Ripples have a frequency of 12 Hz and a wavelength of 0.015 m. Calculate their speed in m/s. [2]
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8. Explain why the wavelength is found by measuring across 10 waves rather than one. [2]
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9. A vibrating string 1.20 m long has 4 loops. Calculate the wavelength. [2]
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10. The string in question 9 vibrates at 50 Hz. Calculate the wave speed in m/s. [2]
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11. Explain why a stroboscope is useful in the ripple tank experiment. [1]
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12. The frequency of the string vibrator is doubled while the tension stays the same. Describe what happens to the wavelength and the speed. [2]
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13. At 75 Hz the wave speed on the 1.20 m string is still 30 m/s. Calculate the number of loops seen. [2]
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14. Suggest why ripples slow down move into a shallower part of the ripple tank. [1]
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#### 4. Before you hand it in

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**Counting 10 crests and calling it 10 wavelengths**

Count wavelengths (gaps), or count crests and subtract one.

**Treating each loop on the string wavelength**

Wavelength =  $2 \times$  loop length.

**Leaving ripple wavelength in cm when calculating speed in m/s**

Convert to metres: 1.5 cm = 0.015 m.

**"A higher frequency makes the waves on the string travel faster."**

A higher frequency gives a shorter wavelength; the speed stays the same.