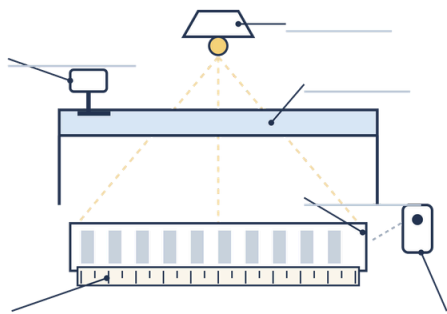


Waves and Infrared Radiation

Required practical 8a — waves in a ripple tank

LABEL THE APPARATUS



RESULTS

time for 10 waves to pass a point (s)	length of 10 waves (cm)
2.1	15.0
1.9	
2.0	
mean =	

Why time 10 waves, and measure 10 waves?

CALCULATE THE WAVE SPEED

Time period $T = \text{mean} \div 10 =$ s

Frequency $f = 1 \div T =$ Hz

Wavelength $\lambda = 15.0 \div 10 =$ cm

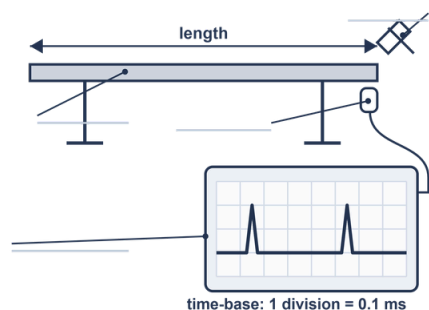
λ in metres =

Speed $v = f \times \lambda =$ m/s

A **slow-motion camera** slows the waves down so you can time them passing a point.

Required practical 8b — waves in a solid

LABEL THE APPARATUS



RESULTS

length of bar (m)	divisions between blips	time-base (ms/div)
1.00		0.1

The **first blip** is the hammer hitting the bar. The **second blip** is the sound

CALCULATE THE SPEED OF SOUND IN THE METAL

Time = divisions $\times 0.1$ ms = ms

Time in seconds =

Distance there and back = 1.00

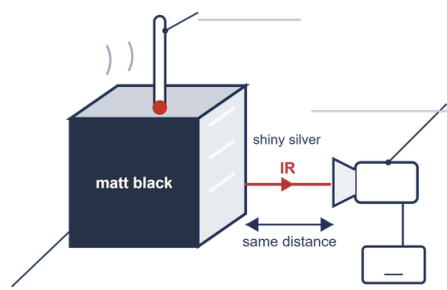
$\times 2 =$ m

Speed $v = \text{distance} \div \text{time} =$ m/s

Why $\times 2$? The sound goes to the far end of the bar and back.

Required practical 10 — infrared radiated by different surfaces

LABEL THE APPARATUS



RESULTS — RANK THE SURFACES (1 = MOST INFRARED)

surface	detector reading	rank
matt black	92	
shiny black	76	
matt white	40	
shiny silver	12	

Every face is at the **same temperature** because the cube is — a good conductor — full of hot water.

CONCLUSION

surfaces are the best emitters of infrared. surfaces are the worst.

A good emitter is also a good of infrared.

CONTROL VARIABLES — KEEP THE SAME:

1 the from the detector to each face

2 the of the water (take each reading quickly)

APPLY IT

A teapot keeps tea hot for longest if its outside is , because that surface is a poor of infrared.

Solar water-heating panels are painted so they as much infrared as possible.