

# Scheme of Learning: Waves

## Topic Sequence:

1	2	3	4	5	6	7	8	9	10	11
Organisation	Electric Circuits	Chemical Changes	Mains Electricity	Quantitative Chemistry	Using Resources	Electro-Magnetism	Homeostasis & Response	Energy Changes	Ecology	Waves

## Topic Overview:

Wave behaviour is common in both natural and man-made systems. Waves carry energy from one place to another and can also carry information. Designing comfortable and safe structures such as bridges, houses and music performance halls requires an understanding of mechanical waves. Modern technologies such as imaging and communication systems show how we can make the most of electromagnetic waves.

## Lesson Sequence:

This topic begins with a recap of the information covered at KS3 including all the vocabulary needed to describe a wave. It then moves on to introduce the wave equation and apply it to both waves in water (the ripple tank) and waves in solids (standing wave generator) in the first required practical of the topic.

Then the topic focuses on ray diagrams and the behaviour of light as it meets a boundary. Moving onto other type of waves for the separate physicists including sound, ultrasound and seismic waves.

All students then look in detail at the electromagnetic spectrum including a required practical on infra red radiation.

Finally, separate physicists then look in detail at the behaviour of light through lenses, the science of colour and why the nature of the surface of an object affects how much radiation it absorbs, emits or reflects.

## Sequence of Lessons:

## Resources:

1	Describing a wave	1	Slinky, worksheet – wave diagram
2	The wave equation	2	Worksheet – the wave equation
3	Measuring waves RP <i>mid-topic assessment</i>	3	Ripple tank, metre ruler, large sheet of card, signal generator, standing wave equipment, worksheet – RP instructions
4	Reflection and refraction	4	Coin and mug, ray box + slit, variable power supply, mirror and stand, glass/perspex block, A3 paper, protractor, worksheet – RP instructions
5	Refraction RP <i>separate physics only</i>	5	
6	Lenses <i>separate physics only</i>	6	Ray box + triple slit, variable power supply, convex lens, concave lens, graph paper
7	Visible light <i>separate physics only mid-topic assessment</i>	7	Coloured glasses, filters
8	Sound waves <i>separate physics only</i>	8	Sig gen, loudspeaker and oscilloscope, worksheet – ghostbusters, ear model, worksheet – ear diagram
9	Ultrasound <i>separate physics only</i>	9	Worksheet – ultrasound calculations
10	Seismic waves <i>separate physics only</i>	10	n/a
11	Electromagnetic spectrum	11	Worksheet – e-m spectrum cut and stick
12	Producing electromagnetic waves	12	n/a
13	Infra red RP <i>mid-topic assessment</i>	13	Leslie cube, IR detector, kettle, worksheet – RP instructions
14	Black bodies <i>separate physics only</i>	14	Information sheet – electromagnetic spectrum
15	Revision	15	n/a
16	Test	16	n/a

## Supportive Reading:

Comprehension activity	TBC
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## Assessment:

Knowledge:	Multiple choice and short answer questions.
Application of Knowledge:	Exam questions based on the skill of calculate