

Science

Year 8: Light

Assessment Opportunities	Literacy/Reading opportunities	CEIAG Links
<ul style="list-style-type: none">Regular low stakes quizzing of AO1- self marked.In class past paper questions where – self / peer markedExtended writing is teacher marked with personalised feedback provided.End of unit assessment self & teacher marked with collective feedback provided.	<p>Reciprocal reading: The speed of light</p> <p>Key vocab is highlighted in the SOL</p>	<p>Spotlight on careers: Laser technician</p> <p>Other careers:</p> <ul style="list-style-type: none">OphthalmologistPhotographerHighway maintenance engineerRadiographer

Curriculum vision:

“Our aim is to deliver a curriculum that is inclusive, relevant and progressive for all learners.”

- **KS3 Light**

Big Picture:

This unit on light cover most of the phenomena associated with light. This includes reflection, refraction, emission, absorption, dispersion, and transmission. There are several practical activities associated with each phenomenon. Students are expected to understand these phenomena and explain why they happen. This unit also covers uses of light and the eyes. Students are expected to know how the eye works and how poor eyesight can be corrected using corrective glasses with either concave or convex lenses.

Lesson sequence	Learning outcomes / Key knowledge (including NC KS3) <i>Interleave / review.</i> <i>Scaffold</i>	Skills development: Reading / writing / data / numeracy / graph work	Spec / book reference
1. TBAT: Describe wave motion as a way of transferring energy.	<ul style="list-style-type: none"> • State that waves transfer energy but not matter. • Describe transverse and longitudinal motion. • Identify the wavelength and amplitude of a wave from a diagram. • Describe wave reflections in terms of wavefronts. • Describe superposition of water waves causing increases and decreases of amplitude. <ul style="list-style-type: none"> ○ <i>Use visual aids – and pictures to prompt discussion.</i> ○ <i>Provide knowledge organisers / key vocab with definitions.</i> 		<p>Spec NC pos <u>here</u> pg 11-12</p> <p>Boost book page 154</p>
2. TBAT: Describe what happens when light interacts with materials	<ul style="list-style-type: none"> • Recognise the value of the speed of light in metres per second • State the difference between luminous and non-luminous objects • Explain what happens to light when it hits a surface • State the difference between transparent, translucent and opaque objects <ul style="list-style-type: none"> ○ <i>Use visual aids – including pictures and examples to prompt discussion about energy stores.</i> ○ <i>Define key vocab associated with light – breakdown of words using prefixes</i> ○ <i>Chunked learning with tasks spread throughout the lesson</i> 		<p>Spec NC pos <u>here</u> pg 11-12</p> <p>Boost book page 154</p>
3. TBAT: Explain how images are formed in a plane mirror using a ray diagram	<ul style="list-style-type: none"> • Use ray diagrams to show ray paths for light including reflection. • State the law of reflection. • Apply the law of reflection to find missing angles. • Apply law of reflection to find the position of objects in a plane mirror.. 		<p>Spec NC pos <u>here</u> pg 11-12</p>

	<ul style="list-style-type: none"> ○ Use visual aids – including pictures and examples to prompt discussion about energy stores. ○ Define key vocab associated with light – breakdown of words using prefixes ○ Chunked learning with tasks spread throughout the lesson 		Boost book page 154
4. TBAT: Use a ray diagram to describe how light travels through a transparent block	<ul style="list-style-type: none"> ● Draw a ray diagram showing the refraction of light entering a glass block. ● Draw the complete path of a ray of light passing through a glass block and convex lens. ● Apply the concept of refraction to explain a range of effects, such as a fish hunting for food on the surface of a body of water. ● Explain the refraction of light in terms of changes of speed. <ul style="list-style-type: none"> ○ Use visual aids – including pictures and examples to prompt discussion about energy stores. ○ Define key vocab associated with light – breakdown of words using prefixes ○ Modelling of practical – can be run as a slow prac. 		Spec NC pos here pg 11-12 Boost book page 154
5. TBAT: Describe how the eye & pinhole camera work.	<ul style="list-style-type: none"> ● Identify the parts of the eye and state their functions. ● Explain how we see an image ● Describe similarities and differences between cameras and eyes. <ul style="list-style-type: none"> ○ Use visual aids – including pictures and examples to prompt discussion about energy stores. ○ Define key vocab associated with light – breakdown of words using prefixes ○ Chunked learning with tasks spread throughout the lesson 		Spec NC pos here pg 11-12 Boost book page 154
6. TBAT: Describe how lenses correct short-sight and long-sight (Writing task)	<ul style="list-style-type: none"> ● Describe the difference between long and short sighted. ● Explain how different types of lenses are used to correct long-sight and short-sight. ● Evaluate the uses of corrective glasses. <ul style="list-style-type: none"> ○ Use visual aids – including pictures and examples to prompt discussion about energy stores. ○ Chunked learning with tasks spread throughout the lesson ○ Structure and style or writing task 	<ul style="list-style-type: none"> ● plan a piece of extended writing. ● Write a comparative piece 	Spec NC pos here pg 11-12 Boost book page 154

<p>7. TBAT: Explain what happens when light passes through a prism and coloured filters</p>	<ul style="list-style-type: none"> • State that white light is a combination of a wide range of colours. • Draw a diagram showing dispersion by a prism. • Describe the action of a filter. • Describe how coloured light can be combined to produce new colours. <ul style="list-style-type: none"> ○ Use visual aids – including pictures and examples to prompt discussion about energy stores. ○ Define key vocab associated with light – breakdown of words using prefixes. ○ Chunked learning with tasks spread throughout the lesson. 	<ul style="list-style-type: none"> • Plan a piece of extended writing. • Write a comparative piece. 	<p>Spec NC pos <u>here</u> pg 11-12</p> <p>Boost book page 154</p>
<p>8. TBAT: Engage with a scientific article.</p>	<ul style="list-style-type: none"> • Discuss the experimental evidence for the speed of light. • Analyse a piece of text about the speed of light <ul style="list-style-type: none"> ○ Reading rulers, tracking as teacher reads ○ Larger text chunked as needed. ○ Modelling highlighting & annotation of text 	<ul style="list-style-type: none"> • Reciprocal reading - The speed of light 	<p>Spec NC pos <u>here</u> pg 11-12</p> <p>Boost book page 154</p>
<p>9. TBAT: Describe the transfer of information using waves and the wave speed equation.</p>	<ul style="list-style-type: none"> • State that waves transmit energy and can carry information in various forms. • Investigate the relationship between wave speed, frequency and wavelength. • Describe energy transfers involving waves. • Calculate the speed of a wave from wavelength and frequency. • Use the wave speed equation to calculate speed, frequency and wavelength of travelling waves. <ul style="list-style-type: none"> ○ Use of modelled examples ○ EVERY (Equation, Values, Enter, Results, Units) to answer equation based problems 	<ul style="list-style-type: none"> • Equations practice • Rearranging equations 	<p>Spec NC pos <u>here</u> pg 11-12</p> <p>Boost book page 154</p>
<p>Vocab</p>	<p>Links to previous learning / interleaving</p>	<p>Assessment & homework</p>	

<p>L3 Vocab</p> <ul style="list-style-type: none"> Reflection Refraction Spectrum Dispersion Prism Angle of Incidence Angle of Reflection Lens Concave 	<ul style="list-style-type: none"> Convex Transparent Translucent Opaque Shadow Absorption Scattering Wavelength Frequency Amplitude Electromagnetic Spectrum 	<p>L2 Vocab</p> <ul style="list-style-type: none"> Wave Light Disperse Reflect Transmit Transparent Sight Vision 	<p>Command words focus</p> <ul style="list-style-type: none"> Label Plot Measure Predict Identify Estimate Observe Justify Evaluate Compare construct 	<p>KS3 Sound</p> <ul style="list-style-type: none"> ○ Transverse and longitudinal waves <p>KS2</p> <ul style="list-style-type: none"> ○ Forces ○ Electricity ○ Magnets 	<ul style="list-style-type: none"> • Regular low stakes quizzing of AO1 • In class assessment of AO1, AO2, AO3 using past paper questions where appropriate • Written word is assessed with personalised feedback provided. • End of unit assessment marked with collective feedback provided. <p>Homework is set weekly and is outlined in the half-termly homework booklet. Homework includes</p> <ul style="list-style-type: none"> • online quizzes on Carousel • Learning of content for in-class quizzes • Completion of written questions.
<p>Independent learning</p> <ul style="list-style-type: none"> Waves (youtube.com) Light (youtube.com) Reflection (youtube.com) Refraction (youtube.com) The eye (and pinhole camera) (youtube.com) Colour (youtube.com) 				<p>Misconceptions / common errors</p> <ul style="list-style-type: none"> • Lenses only magnify • Light cannot change direction • Objects emit light (the moon) • White light is colourless 	