

Meden School Curriculum Planning							
Subject	Physics	Year Group	8	Sequence No.		Topic	Light and Sound

Retrieval	Core Knowledge	Student Thinking
What do teachers need retrieve from students before they start teaching new content ?	What specific ambitious knowledge do teachers need teach students in this sequence of learning?	What real life examples can be applied to this sequence of learning to development of our students thinking, encouraging them to see the inequalities around them and 'do something about them!'
<p>KS1 year 1: parts of the human body and the senses – eyes to see and ears to hear.</p> <p>KS1 year 2:</p> <p>KS2 years 3 & 4: the need for light to be able to see things. Light is reflected off of surfaces, how shadows form, how size of shadows can change. Know the different between solids, liquids and gases.</p> <p>Sounds get fainter the further away you are.</p> <p>KS2 years 5 & 6. Know how the human body can change as we age. Hearing and sight deteriorate. How animals adapt to their environment, including ear size. Know that light travels in straight lines.</p> <p>KS3 Y7 :</p>	<p>L1: know that sound and wave travel by waves. Waves transfer energy from one place to another. The movement of a wave is called an oscillation. Know that there are two types of waves. Transverse and longitudinal. Recall how to demonstrate both transverse and longitudinal waves on a slinky. Know that light is a transverse wave and sound is a longitudinal wave.</p> <p>L2: Know that any substance a wave passes through can be called a 'medium', and a vacuum refers to an area of empty space with no particles in it. Know that mechanical waves need a medium to travel through. Recall that light travels in straight lines. Describe how shadows form. Know that light travels at 300,000,000m/s.</p> <p>Draw simple diagrams to show light travelling in straight lines and reflecting of objects before entering our eyes. Be able to make a simple pinhole camera and construct a diagram to show how light travels in a pin hole camera to form an image.</p> <p>L3: Know that the law of reflection states that the angle of incidence is equal to the angle of reflection. Use light ray boxes to construct reflection diagrams. Use a protractor to accurately measure angles of incidence and angles of reflection. Give examples of uses of mirrors. Eg, rear view mirrors in a car, on roads near sharp bends, at the dentist</p> <p>L4: Know that refraction is the bending of light at the boundary between two medium of different densities. Give examples of when we see refraction. Eg, spoon in water, swimming pools look shallower.</p> <p>Use ray boxes to construct refraction ray diagrams. Use protractors to measure incident rays and refracted rays at a range of different angles. Know that the bending of light is due to a change in speed of light at the boundary between two different medium. When light enters a more dense medium it slows down so bends towards the normal, when it enters a less dense material it speeds up so moves away from the normal.</p>	<p>L7: Damage to the eye can lead to blindness. Consider how does blindness can affect day to day life and what is available to support blind people. Eg, braille, audio descriptions for TV, audio books, guide dogs.</p> <p>L10: damage to the ear can lead to deafness. Discuss how deafness can affect daily lives and what is available to support deaf people. Eg, hearing aids, hearing loops, sign language, captions and subtitles.</p>

L5: Know that **dispersion** is the splitting of **white light**. Recall the 7 colours of light in order: **red orange yellow green blue indigo violet**. Recall examples when we see the **natural dispersion** of light such as rainbows. Use a **prism** to split white light and create a **spectrum** of colour. Define the word **wavelength** as the distance between **peak** to peak of a wave. Know that red light has the **longest** wavelength and indigo has the **shortest** wavelength of the 7 colours.

L6: Know that **periscopes** use mirrors to be able to see around corners. Recall examples of when periscopes can be used, eg, submarines. Design and construct a periscope.

L7: BE able to label the structures in the **human eye**. Describe what each part of the eye is and does. The **cornea** is the coating on the front of the eye and refracts light. The **iris** is the coloured part of the eye and is a circular muscle that controls how much light enters the eye. The **pupil** is where light enters the eye. It is small in bright light and large in dim light. The **lens** changes shape to focus on different objects at different distances. The **retina** contains **nerve cells** called **rods and cones**. The **blind spot** is where nerves are missing as the retina enters the optic nerve. The **optic nerve** carries signals from the retina to the brain.

L8: Know that sound is made when an object **vibrates**. When particles are pushed together it is called a **compression**. When particles spread out it is called a **rarefaction**. Explain that sound travels through solids faster than a liquid or a gas because the particles are closer together. Give examples of sound travelling through gases, liquids and solids. Know that sound can be **reflected** off of surfaces. This is called an **echo**. Describe how the reflection of sound can be used to determine the depth of the ocean. Know that **ultrasound** refers to anything above **20kHz** and cannot be heard by humans.

L9: Recall that speed can be calculated using distance divide by time. Use basic equipment to calculate the speed of sound. Be able to calculate an average. Know that the average speed of sound in air is 340m/s, water is 1500m/s and solids is 5000m/s. Recall that accuracy means how close a measurement is to the true value.

L10: know that the ear can be split into 3 main parts; **the outer ear, the middle ear and the inner ear**. Be able to label the **ear canal, ear drum and ear bones, and cochlea** on a diagram of the ear. Be able to correctly order the path of sound through the ear from the ear canal, ear drum, ear bones, cochlea, **auditory nerve**.

	<p>Understand how the parts of the ear could become damaged and lead to hearing impairments and know how ear plugs and ear defenders can reduce hearing damage.</p> <p>L11: Know that an oscilloscope can be used to convert sound waves into transverse waves on a screen so that we can see and measure them. Describe how louder sounds have a higher amplitude than quieter sounds. Describe how high pitch sounds have a shorter wavelength and higher frequency than low pitch sounds. Label a crest and trough on a wave diagram. Draw sound waves of different volumes and pitch.</p> <p>L12: Revision</p> <p>L13: End of Topic Test</p> <p>L14: GPA test feedback</p>	
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