

Question: Why can't we see things when it is pitch black?		<u>Critical Learning</u> Use the idea that light travels in straight lines to explain that objects are seen because they give out or re- flect light into the eye Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. <u>Key Vocabulary</u> Reflect Refract Source Transparent Opaque Visual Surface Absence
<u>National Curriculum Link</u>		
<u>International Baccalaureate Learner Profile Link</u> Inquirers - Nurture skills for research and curiosity Knowledgeable - Develop conceptual understanding and engage with issues and ideas Principled - think and act with integrity and honesty Reflective - Consider the wider world and our own ideas and experience Communicators - express yourself confidently and creatively		
<u>Prior Skills - Y1</u> • Know that electricity is an important source of light • Identify and name the sources of light, including electricity being an important source of light • Identify and name sources of light • Understand what darkness is • Compare sources of light using scientific language (brightest, duller, darker, lighter) • Observe and describe shadows during the day • Know that the Sun lights up the Earth and safety with the sun • asking simple questions and recognising that they can be answered in different ways • observing closely, using simple equipment • performing simple tests • Explore, using the senses and talk about	<u>Prior Skills - Y3</u> • Recognise that they need light in order to see things • Recognise that dark is the absence of light • Understand and notice that light is reflected from surfaces • Recognise that light from the Sun can be dangerous and that there are ways to protect their eyes • Recognise that shadows are formed when the light from a light source is blocked by a solid object • Find patterns in the way that the size of shadows change. • Make and record a prediction before testing • Measure using different equipment and units of measure • Record their observations in different ways (labelled diagrams, charts etc.)	<u>New Skills - Y6</u> • Recognise that light appears to travel in straight lines • Use the idea that light travels in straight lines to explain that objects are seen because they give out or re- flect light into the eye • Explain that we see things because light travels from light sources to our eyes or from light sources to ob- jects and then to our eyes • Explain how different colours of light can be created • Use the idea that light travels in straight lines to ex- plain why shadows have the same shape as the objects that cast them. • ask a variety of types of scientific questions • choose the most appro- priate scientific enquiry method to answer a ques- tion and outline the method • use simple models to de- scribe scientific ideas

they see (see, touch, smell, hear or taste) - Record observations and results to a test using drawings and in simple tables - Use simple equipment to help them make observations - Tell other people about the testing they have done - Record their findings in a table or chart	- Describe what they have found using scientific words - Make accurate measurements using standard units - Explain what they have found out and use their measurements to say whether it helps to answer their question	- make predictions based on scientific knowledge - draw conclusions from observations and findings based on scientific knowledge - Test a scientific idea and show evidence which supports it - Present a report of their findings through writing, display and presentation
--	---	---

Knowledge, Skills and Understanding

- Recognise that light appears to travel in straight lines
- Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye
- Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes
- Explain how different colours of light can be created
- Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

Knowledge, Skills and Understanding for Working Scientifically

- ask a variety of types of scientific questions
- choose the most appropriate scientific enquiry method to answer a question and outline the method
- use simple models to describe scientific ideas
- make predictions based on scientific knowledge
- draw conclusions from observations and findings based on scientific knowledge
- Test a scientific idea and show evidence which supports it
- Present a report of their findings through writing, display and presentation

Challenge for children working at great depth

- Can they use and explain how simple optical instruments work? (periscope, telescope, binoculars, mirror, magnifying glass, Newton's first reflecting telescope)
- Can they explore a range of phenomena, including rainbows, colours on soap bubbles, objects looking bent in water and coloured filters.

Resources - torches with powerful beams - white card - small mirrors - selection of shiny/polished and unpolished/dull materials - opaque objects for shadow formation - metre sticks or tape measures	Website/Apps http://www.bootslearningstore.com/ks2/eyesight.html Teacher background information. http://www.channel4learning.net/sites/essentials/science/physical/howweseebi.jsp https://wowscience.co.uk/resource/light/ SIL Catch Up Materials (online and science folder) Seneca Oak Academy
	Suggested Quality Texts Periscope by Michael Rosen Kingfisher Light and Energy Day and Night by Jay Richardson

Assessment ideas Draw and label different lines of vision	Writing Opportunities Instructions for designing a periscope
Cross Curricular Links RE: Diwali - Festival of Light Art: Children to do close observational sketches of the eyes giving attention to proportion. Perspective drawing opportunity. Art: provides opportunities to look at the work of several famous painters, including Constable and Cezanne giving particular attention to light, tone and shadow before attempting their own work. English: Read Periscope by Michael Rosen then create a periscope and explain how it works.	