Light		
KS 1	Lower KS2	Upper KS2
Need to risk assess any contact with materials, use the CLEAPs folder to check on the health and safety recommendations for the activities.	*Need to risk assess any contact with materials, use the CLEAPs folder to check on the health and safety recommendations for the activities.*	*Need to risk assess any contact with animals, use the CLEAPs folder to check on the health and safety recommendations for the activities.*
Pupils recognise different light sources, including the sun - Explore a range of light sources from school/home including the sun. E.g. sorting real objects into light sources/not light sources	**Pupils recognise that dark is the absence of light.** - Recap on light sources from KS1 and mind map prior learning. Establish that we need light and our eyes in order to see things. Shut eyes in a dark room. Extend range of light sources.	
Pupils recognise that light from the sun can be dangerous and that there are ways to protect their eyes - Understand that it is not safe to look directly at the sun - Health and safety - Set up a dark area somewhere in the classroom to explore light sources e.g. dark den - Explore light sources at home/school e.g. light source walk around school, how many can you spot on your way to school? etc	**Pupils recognise that they need light in order to see things.** - Pupils compare same light sources. E.g. different torches (wind-up, different sizes, different coloured lights) and candles and compare brightness and shadows cast.	**Pupils understand that there are several different light sources, made up of primary and secondary light sources.** - Briefly revisit primary light sources such as light bulbs, candles, and the sun. Explore secondary light sources (where light is produced as a by-product, such as LED's, TV, IBW, Mobile Phones, and in nature, glow worms, fire flies. The Moon is a secondary light source, produced by reflection from the sun).
Pupils recognise that shadows are formed when the light from a light source is blocked by a solid object - Find where shadows are around them and discuss how they are made and why they are that shape. - Make their own shadows using their own body and other objects. - Explore the best materials to make shadows e.g. baking paper, cling film, sequin waste, binka, wood, range of papers with different colours/thickness. Following on from that, children to use their knowledge to make their own shadow puppet.	**Pupils recognise that shadows are formed when the light from a light source is blocked by a solid material.** **Pupils recognise that shadows can be changed.** **Find patterns in the way the size of the shadows change.** - Revisit KS1 learning - What is a shadow? - Explore how shadows are formed (blocking of light). Investigate which material makes the 'best' shadow. Use the language opaque, transparent and translucent. Explore materials and group into opaque, translucent and transparent. Examples could include wood, metal cardboard (opaque), tissue paper, tissues, (translucent) and glass, clear cellophane (transparent). Could look at different plastic cups. (A shadow is made when an object blocks light. The object must be opaque or translucent to make a shadow. A transparent object will not make any shadow, as light will pass straight through it. Opaque materials do not let any light pass through them. They block the light. Translucent materials let some light through. Opaque objects make dark shadows. Translucent objects make faint shadows.) - Explore with torches how to change a shadow. Investigate how shadows are changed by changing the position of the light source. Identify, in simple terms, patterns in the way that the size of the shadow changes. - Look at torches which have different coloured lights. Investigate the shadows they make.	**Pupils understand that light appears to travel in straight lines.** **Pupils use the ideas that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.** **Pupils explore the patterns in the length and direction of shadows as the position of the light source is changed.** - Briefly revisit and consolidate the terms opaque, translucent, transparent and give examples. Use to establish that a shadow is formed by an opaque object blocking a light source. - Explore shadows made by different objects. Use this to establish that shadows have the same shape as the objects that cast them. - Explore idea that light travels in a straight line and that this determines the shape of the shadow. Pupils use their experiences to draw diagrams showing how the shadows are made. - Investigate how shadows can be changed in direction and length. They explore patterns in the direction and length of shadows as the position of the light source is changed and use to make further predictions.
Notice that light is reflected from surfaces - Explore which materials they can see themselves in using real life materials around them e.g. door handles, puddles, windows, - Understand that some materials reflect light and some don't, highlighting the	**Pupils recognise that light is reflected from some surfaces.** - Explore briefly reflective and non-reflective surfaces. Which ones can you see your face clearly in or not at all? (KS1learning) - Play games to establish that the direction of light can be changed by using mirrors. For example, looking around corners, writing name in the mirror,	**Pupils explore how light is reflected from a reflective surface.** - Explore how light is reflected back as it hits a reflective surface. (May be likened to a ball bouncing off a wall, snooker balls bouncing of the side of the table.) They might explore rear-view mirrors on cars, fun fare mirrors, mirrors from Ikea Use this to establish that a reflection is caused by light bouncing back off a reflective surface.

importance of this use in reflectors (safety aspect) - Invite in road safety groups - Safer Schools Partnerships - Make the best reflector for Santa's sleigh - Make their own mirrors. Which is the best material to see themselves in? Which is the best reflector? **Recognise that they need light in order to see things and that dark is the absence of light** - Explore which colours are easier to see in a dark box. E.g. Why do you think it is easier to see the yellow car? - Explore what they need to be able to see objects - light source and eyes. E.g. dark room, using the dark den, introduce light source slowly and discuss changes. **Key Vocabulary** opaque translucent transparent reflection mirror shadow **Opportunities for scientific investigation** **Opportunities for Data Handling/Maths**	triangle of mirrors with an object inside, bending plastic mirrors, reflections in spoons (Hall of mirrors). - Explore how the direction of light can be changed by using mirrors and by looking at a kaleidoscope. Pupils explore what they can see with one mirror and what they see behind them. Can they see to one side? Pupils use a mirror or mirrors to see round a corner. Working in groups, pupils send a 'light' message round a corner from one child to another. **Pupils recognise that they need light in order to see things.** **Pupils recognise that light from the sun can be dangerous and that there are ways to protect their eyes.** - Explore their range of vision ie how far they can see without turning their head, how far away they can see detail. Compare to the sight chart used by opticians. - Recognise that light from the sun can be dangerous and explore ways in which we can protect our eyes such as not looking directly at the sun even when wearing sunglasses. - Explore what we need in order to see? They explore a dark den with light sources and try covering eyes to establish that we need a light source and our eyes in order to see. - Record how they think they see by drawing pictures. (Light bounces off objects into our eyes. This should be built from pupils' experience.) **Key Vocabulary** opaque translucent transparent reflection mirror shadow reflective and non-reflective UV light **Opportunities for scientific investigation** **Opportunities for Data Handling/Maths**	- Explore where to place mirrors to be able to see objects etc. - Pupils use learning to make a periscope. They use the idea that light appears to travel in straight lines to explain how it works. - Explore how light travels on a curved reflective surfaces such as convex and concave. **Pupils explore different light effects such as rainbows, refraction.** - Explore light by looking at a range of phenomena such as rainbows, colours on soaps bubbles, splitting light into colours using a light box, objects appearing to bend in water. (Opportunities for visits, Techniquest dome, Techniquest, Wrexham. - Research work of scientists who work or have worked on light eg Isaac Newton. **Pupils 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.** **Pupils use the ideas that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye.** - Discuss ideas of how they see. Draw together their ideas to establish that when we see, light from a light source is reflected from an object into our eyes. - Pupils draw simple diagrams to show how light travels from a light source to the object and to the eyes. - Experience how their eyes change in response to light. They open and close their eyes in light and dark situations to observe changes in the size of the iris. Make links to a camera shutter. Make links to real life applications of science such as opticians lenses and microscopes. **Key Vocabulary** opaque translucent transparent reflection mirror shadow reflective and non-reflective UV light rainbows, refraction, periscope opticians lenses and microscopes and eye vocabulary. primary and secondary light sources. **Opportunities for scientific investigation** **Opportunities for Data Handling/Maths**

Resources **Range of light sources, sunglasses, torches, materials to test shadows, everyday materials, reflective & non reflective materials and dark boxes.**	**Resources** **Range of light sources, sunglasses, torches, materials to test shadows, everyday materials, reflective & non reflective materials and dark boxes. Translucent materials**	**Resources** **Range of light sources, sunglasses, torches, materials to test shadows, everyday materials, reflective & non reflective materials and dark boxes. Translucent materials**