Light Knowledge Progression

	Knowledge	Key Vocabulary
Nursery		
Reception		
Y1		
Y2		
Y3		
Y4	We need light to be able to see things. Light travels in a straight line. When light hits an object it is reflected (bounces off). If the reflected light hits our eyes, we can see the object. <u>Reflection</u> Some surfaces and materials reflect light well and these can be very useful. Some examples of useful reflective surfaces and materials are hi-vis jackets and cat's eyes. The surfaces that reflect light best are smooth, shiny and flat. Mirrors reflect light very well, so they create a clear image. An image in a mirror appears to be reversed. For example, if you look in a mirror and raise your right hand, the mirror image appears to raise its left hand. The pupils in the eyes control the amount of light that enters the eyes. If too much light enters then it can can damage the retina. To help protect the eyes you can wear a hat with a wide brim and sunglasses with a UV rating **Shadows** A shadow is caused when light is blocked by an opaque object. A shadow is larger when an object is closer to the light source. This is because it blocks more of the light. When the light source is directly above the object, the shadow will be directly underneath. When a light source is to one side of an object, the shadow will appear on the opposite side. The shadow will also be longer.	**Light source:** An object that makes its own light **Dark:** Dark is the absence of light **Reflection:** The process where light hits the surface of an object and bounces back into our eyes **Reflect:** To bounce off **Reflective**: A word to describe something which reflects light well **Ray:** Waves of light are called light rays. They can also be called beams. **Pupil:** The black part of the eye which lets light in **Retina:** A layer at the very back of the eye. The retina takes the light the eye receives. It then changes it into nerve signals to send to the brain **Shadow:** An area of darkness where light has been blocked **Opaque**: Describes objects that do not let any light pass through them **Translucent**: Describes objects that let some light through, but scatter the light so we can't see through them properly **Transparent**: Describes objects that let light travel through them easily, meaning that you can see the object.
Y5		
Y6	**<u>Light</u>** Need light to be able to see things. Light waves travel out from sources of light in straight lines called rays or beams of light The waves do not need a medium to travel through. It can travel through a vacuum – a completely airless space. The law of reflection states that the angle of incidence is equal to the angle of reflection. Whenever light is reflected from a surface, it obeys this law. The angle of reflection is the angle between the normal line and the reflected ray of light. The angle of incidence is the angle between the normal line and the incident ray of light. Refraction - Light bends when it moves from air to water. Isaac Newton **(link to Y5 science on Gravity**) shone a light through a transparent prism, separating out light into the colours of the rainbow/spectrum. All the colours merge and make visible light. A **shadow** is always the same shape as the object that casts it. This is because when an opague object is in the path of light travelling from a light source, it will block the light rays that hit it, while the rest of the light can continue to travelling.	**Refraction –** when light bends as it passes from one medium to another **Visible spectrum –** light is visible to the human eye. It is made up of colours **Prism –** a solid 3d shape with flat sides. The two ends are equal in size and shape. A transparent prism separates out visible light into all the colours of the spectrum **Shadow –** an area of darkness where light has been blocked **Transparent** - objects that let light travel through them easily meaning you can see through the object **Translucent –** objects that let some light through but scatter the light so you can't see through them properly **Opague –** objects that do not let any light pass through them

	Shadows can also be elongated or shortened depending of the angle of the light source. A shadow is also larger when the object is closer to the light source. This is because it blocks more of the light.	