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| Subject: Science Year: Phase 2- Year A- Light  NC/PoS:   * recognise that they need light in order to see things and that dark is the absence of light * 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 an opaque object * find patterns in the way that the size of shadows change |
| Prior Learning (what pupils already know and can do)   * Know that glass is transparent. Know that the movement of Earth in space gives us day and night. Know that in the UK (United Kingdom), the day length is longest in the summer and shortest in the winter. Know that light sources give out light and the sun is a light source. Know that light is essential for seeing things. Know that sources of light show up best at night-time |
| End Goals (what pupils MUST know and remember)   * Know that light is a form of energy * Know that the eyes take in light so we can see * Know that you cannot see anything when there is no light * Know light sources give out light * Know natural light sources are sun, stars, candle flame, fire * Know artificial light sources are light bulbs, florescent lighting, computer screens * Know some objects seem bright but are reflecting light from elsewhere, for example the Moon, mirrors, and shiny objects * Know that light from the Sun is very strong and can damage your eyes * Know the eyes can be protected by wearing dark glasses * Know to never look directly at the sun * Know that light can pass through materials that are transparent like glass * Know that some light passes through materials that are translucent like frosted glass * Know that light cannot pass through opaque materials * Know that when light is blocked by an opaque object, a shadow is formed * Know that the size of the shadow changes depending on the position of the light source * Know that the closer the light source to the object the larger the shadow will be |
| Key Vocabulary: opaque, translucent, transparent, natural sources, artificial light, reflected, absorb, reflective, dangerous, ultraviolet light, radiation, sunburn, protection, blocked, opaque, light rays, overhead, midday |
| Session 1: Recap: properties of materials –opaque, translucent, transparent  Children learn that we need light to see  Know that light is a form of energy  Know that the eyes take in light so we can see  Know that you cannot see anything when there is no light  Suggested activities:  <https://www.youtube.com/watch?v=QSrCnthWGEs> what is light  Use of a black out tent  Vocabulary: opaque, translucent, transparent |
| Session 2: Recap: what can you see in the absence of light  Know light sources give out light  Know natural light sources are sun, stars, candle flame, fire  Know artificial light sources are light bulbs, florescent lighting, computer screens  Suggested activities:  <https://www.youtube.com/watch?v=01SAxjPZbRM> examples of natural and artificial  sources  What sources of light are there in school?  Sort a selection of objects into natural or artificial  Vocabulary: natural sources, artificial light |
| Session 3: Recap: give three examples each of natural and artificial light sources  Know some objects seem bright but are reflecting light from elsewhere, for example the Moon, mirrors, and shiny objects  Suggested activities:  Give a selection of different materials and children explore which ones are more reflective using torches  N.B. black objects absorb the most light so are not very reflective  Vocabulary: reflected, absorb, reflective |
| Session 4: which materials/objects are good reflectors of light?  Children learn the dangers of the sun  Know that light from the Sun is very strong and can damage your eyes  Know the eyes can be protected by wearing dark glasses  Know to never look directly at the sun  ultraviolet light - is a form of **radiation** which is not visible to the human eye.  sunburn - ultraviolet rays can burn our skin cells, the skin gets red and feels warm.  Vocabulary: dangerous, ultraviolet light, radiation, sunburn, protection |
| Session 5: Recap: how is the sun dangerous? What can you do to protect your eyes?  Children learn how shadows are formed  Know that light can pass through materials that are transparent like glass  Know that some light passes through materials that are translucent  Know that light cannot pass through opaque materials  Know that when light is blocked by an opaque object, a shadow is formed  Suggested activities:  <https://www.youtube.com/watch?v=3Mv4qa5c0q8> what are shadows  children go outside and make shadows, blocking the light with their opaque bodies  Use torches to create shadows within the classroom  Create shadow puppets  Vocabulary: blocked, opaque, light rays |
| Session 6: Recap: how are shadows formed?  Children are learning to look for patterns in the size of shadows  Know that the size of the shadow changes depending on the position of the light source  Know that the closer the light source to the object the larger the shadow will be  Know the more directly overhead the light source is, the shorter the shadow (midday)  Suggested activities:  <https://www.youtube.com/watch?v=bepLxu65OdM> size of shadows  children explore shadows using objects and torches  Vocabulary: overhead, midday |
| Link to career scientist:  <https://pstt.org.uk/application/files/3616/3525/6983/Laser_Physicist_-_Professor_Colin_Webb.pdf> |
| Scientists who have helped develop understanding in this field: Sir Isaac Newton – light was made up of tiny particles |