

Unit 1D Light and dark

ABOUT THE UNIT

This unit develops children's understanding of the need for light in order to see things. Children learn that darkness is the absence of light and that in the absence of sunlight other light sources are seen more easily.

Experimental and investigative work focuses on:

- making suggestions of how to investigate an idea
- making observations and comparisons
- explaining observations.

Work in this unit also offers opportunities for children to relate their understanding of science to everyday experiences of light and darkness and to health and safety.

Visually impaired children will need particular support in this unit. They will be able to take part in activities through careful use of residual vision, through their awareness that many light sources are also heat sources and through using their sense of touch. It is important for teachers to help children to be sensitive to those who are visually impaired.

This unit takes approximately 6 hours.

WHERE THE UNIT FITS IN

Builds on Unit 1A 'Ourselves'

Children need:

- to know that sight, hearing and touch are senses.

Links with Units 1C, 1F, 2F, 3F, English, religious education and art.

VOCABULARY

In this unit children will have opportunities to use:

- words and phrases related to light and dark *eg bright, light, dark, black, night, day, reflect, reflective strip*
- names of light sources *eg torch, warning light, Sun, candle, lantern*
- words and phrases used to make comparisons *eg darker/darkest, bright/brighter/brightest*
- expressions giving reasons using 'because'.

RESOURCES

- torches with bright beams, shiny objects, *eg reflective strips from bags, clothing, tinsel*
- story about light/dark
- dark area in the classroom or a classroom that can be darkened
- collection of light sources
- collection of torches
- black box(es), shoe box(es) lined with black paper

EXPECTATIONS

at the end of this unit

most children will:

name a number of light sources, including the Sun; recognise that they cannot see in the dark; describe and compare some light sources and explain why it is dangerous to look at the Sun

some children will not have made so much progress and will:

name a number of light sources including the Sun; recognise that they cannot see in the dark and know that it is dangerous to look at the Sun

some children will have progressed further and will also:

explain that they cannot see shiny objects in the dark because they are not light sources

LEARNING OBJECTIVES

POSSIBLE TEACHING ACTIVITIES

LEARNING OUTCOMES

POINTS TO NOTE

Introduce unit by reading a story or poem about light and dark *eg The owl that was afraid of the dark* and ask children to talk about their experiences of night-time.

This unit is best taught during the winter when it gets dark soon after children leave school.

CHILDREN SHOULD LEARN

- that light is essential for seeing things
- that when it is dark other senses can be used to help us find things and identify things

- ◆ Create a 'dark area' in the classroom or visit a room in the school which can be darkened with curtains or blinds. Ask children to find a particular child or item in the dark room. Gradually increase the light *eg by opening the door, turning on lights one at a time* and ask children to say when they can use their sense of sight to identify the child or item. Ask children to say how they tried to find the object and what they do if they wake up in a dark room. If necessary, prompt them to think about using other senses *eg hearing and touch* when it is dark.

CHILDREN

- describe how they try to find something when it is dark
- recognise they cannot use their sense of sight in the dark
- state that they can see things when there is some light

Children often have no experience of total darkness and sometimes say they can see in the dark because street lights light up their room when they are in bed.

- that there are many sources of light
- that light sources vary in brightness
- to observe and make comparisons of sources of light

- ◆ Take the children on a walk round the school to look for sources of light *eg central light, computer light, warning lights on switches*. Ask them to think of as many light sources as they can. Make a collection of light sources or, using pictures, make a collage showing a variety of light sources. Ask children to compare the light from different sources.

- identify a number of light sources of different kinds
- make comparisons between light sources in terms of brightness or colour

- that sources of light show up best at night-time

- ◆ Ask children about light sources they use at particular times of the year *eg fairy lights, bonfires, fireworks, Halloween lanterns, lights at religious festivals*. Talk about the time of year and time of day these are used and why *eg firework displays take place at night when it is dark*.

- recognise that lights *eg bonfires, fireworks, candles*, show up best when it is dark and that they can see these because they are light sources

 **SAFETY** – Night lights and stubby candles are almost impossible to knock over. All naked flames are best used in a metal tray *eg baking tray filled with dry sand*. Children should be kept away from flames.

- that objects cannot be seen in darkness
- to observe and make comparisons of sources of light and to try to explain what they observed

- ◆ Present children with a 'black box' which has a small peephole in one end and a larger hole covered with cardboard in the top. Ask children to explore the 'black box' to find out if they can see an object when there is no light (cardboard over the hole) and when there is light. Discuss what they can and cannot see. Give children torches of different brightness and ask them to find out what is in the box. Ask them to describe when it was easiest to see the object.

- recognise that a torch will enable an object in a 'black box' to be seen but that when there is no light they cannot see the object
- recognise that some torches give brighter light than others
- explain that objects are easier to see in brighter light *eg this torch was brightest and I could see the toy car best*

- that the Sun is the source of light for the Earth
- that it is dangerous to look at the Sun because it is so bright
- to make observations and to try to explain these

- ◆ On a day when there is sunshine with some clouds, take the children into the playground and ask them to decide without looking at the Sun when it goes behind (or emerges from) a cloud. Ask children to explain how they can tell. Make a list of children's suggestions.

- identify changes that occur when the Sun goes behind a cloud and recognise that these are different from changes at nightfall
- explain that the Sun is a source of light even when it is behind a cloud
- explain why it is dangerous to look directly at the Sun *eg you mustn't look at the Sun because it's very bright and burns your eyes*

Children sometimes think night is caused when the Sun goes behind a cloud.

 **SAFETY** – Warn children NEVER to look directly at the Sun. Blindness can result. See 'Be Safe' section 13.

- that shiny objects need a light source if they are to shine
- that shiny objects are not light sources
- to suggest how to find out about where a reflective strip will shine brightly
- to make observations and simple comparisons and to say whether what they found out was what they expected

- ◆ Ask children about how they can be seen more clearly at night on their way home and ask them why they think reflective strips on bags and clothes show up at night. Help them to test suggestions about how they think reflective strips can be made to shine or show up *eg put it in the dark, shine a light on it* and to use observations to make comparisons. Talk about shiny decorations *eg tinsel* and show children that this shines when it is near a light source.

- recognise that a shiny object needs a light source if it is to shine
- explain that a shiny object doesn't shine in a dark room
- say whether they expected the reflective strips to shine near a light source

Children may suggest the object will shine brightly in a dark cupboard indicating that they think it is a light source. Reflection from shiny surfaces is covered in the Key Stage 2 programme of study. However, it is valuable to try to establish at Key Stage 1 that even though an object is shiny it isn't a light source. Many children will be familiar with the words 'reflect' and 'reflection'.

Review work on light with children and ask them to make a night/day, dark/light collage or picture *eg 'What we can see in daylight' and 'What we can see when it is night'*. Discuss with children what their pictures/collages show.

- produce a collage or picture which makes a clear distinction between night/day or dark/light

Night/day or light/dark pictures could be produced using IT.

