

MEDIUM TERM PLAN
KS1 SCIENCE

LIGHT AND DARK

Written by science expert Deborah Herridge, this six-week series of lessons focuses on helping children in KS1 experience light and dark and explore simple ideas about light sources, reflectors and how we need light to see. We've included six weeks of learning objectives, activities and assessment ideas to help get your planning off to a great start.

switch on electric lights. Prompt the idea that the light children are talking about must come from somewhere, eg the sun, an electric light, a candle, etc. Introduce the word 'source' as somewhere that light comes from.

Ask whether the children like the light or the dark best and elicit reasons for choices. Talk about the light and dark places they may have experienced and model how to complete the light and dark places worksheet [resource 2]

Assessment
 Look for an understanding of darkness being an 'absence' of light and that absence means 'without' or 'lack of'. Look for children being able to recount their experience of light and dark places and make comparisons between light and dark places.

WEEK 2
Learning objectives:
 • Identify different sources of light

Remind children of previous learning about light and dark and how they compared day and night time pictures. Show the slide showing a city at night [resource 3]. Is this picture in the daytime or night-time? Explain that this is a picture of a city at night but that there are so many lights that it looks almost like daytime. Explain that because we have electric lights and other light sources it is very rare that we are in total darkness, even in the middle of the night when there is no sunlight.



FEATURES PLANNING

selection of objects. Keeping the top hole covered, ask the children if they can see the objects in the box when there is no light. Discuss what can and can't be seen. Now give each group a torch and remove the top hole's flap. Ask the children to describe when it was easiest to see the objects in the box. Help them to realise that we need light in order to see.

Assessment
 Children should recognise that when there is no light they cannot see objects. When there is more light, they can see objects more easily.

WEEK 4
Learning objectives:
 • Identify some light reflectors
 • Predict and test whether an object will be a good reflector of light

Start the lesson by choosing children to mime a light source such as striking a match or switching on a torch. Can the rest of the group guess it? Show the pictures of light sources and reflectors [resource 4]. With their talk partners, ask children to identify each object in turn and decide whether it is a light source or not. Explain that some things 'reflect' light. They do not make their own light, but light from a source bounces off these objects and

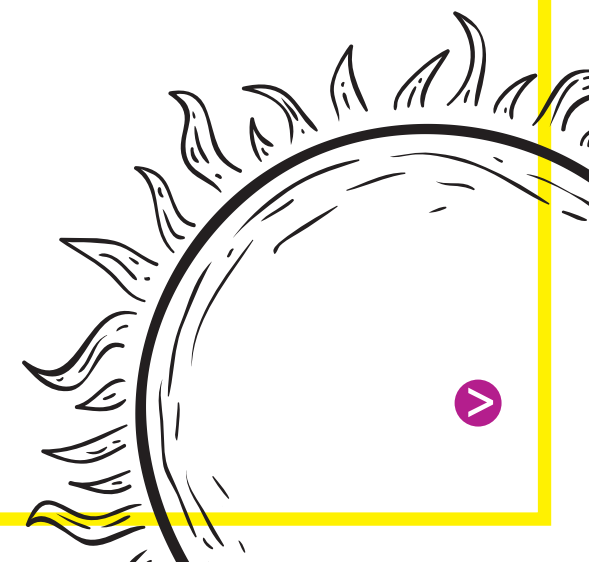
WEEK 3
Learning objectives:
 • Experience darkness
 • Know we need light to see

In preparation for this and subsequent lessons, get children to help you make a 'classroom cave'. This could simply be a table with a heavy blanket thrown over it. Organise a selection of safe light sources, reflectors (eg mirrors, tinsel, reflective strips, shiny metal objects) and non-reflective objects (eg soft toys, bricks) to investigate in the 'cave'. Small groups of children can go in to experience what the dark is like (don't force children who are nervous). Remind them that darkness is the 'absence' of light. If the space is completely dark they shouldn't be able to see anything at all but as they grow accustomed to the darkness they may be able to see outlines or shapes of objects. Give them torches as a light source to enable them to see. Put different pictures or objects in the cave as a test to see how much children can see with and without light.

Take a shoebox and paint its interior black. Make a two-pence-sized hole at one short end. Make another hole in the lid but create a cardboard flap to cover it. Give each group of children the box and a

Assessment
 Use examples of children's drawings.

"Explain that the sun is the most powerful and important source of light we have"



Light and dark places

Light places (Draw a picture)	Dark places (On the cinema)

I like being in the _____ the best (light, dark)

My drawing of me in the _____ (name of light place or dark place)

Cut out & m

WEEK 1
Learning objectives:
 • Know that darkness is the absence of light
 • Compare light and dark places

Before you start the lesson make your room as dark as possible – cover windows with thick black paper, draw the blinds and make sure all gaps are covered so no light seeps through. Turn off any lights. Be aware that at this age, some children may feel nervous about being in darkened places. If this is the case, allow these children to sit close to you. Ask children as they arrive to describe what the classroom is like. Is it the same as usual? How is it different? Explain that we will be learning about light and dark. ing from children

on what light and dark mean to them. Accept all responses and use this initial questioning phase as formative assessment of children's understanding. Show the short 'light and dark' slideshow [resource 1] and encourage children to describe what they can see in the daytime and the nighttime pictures. Help them notice that the colours and amount of activity are different in the day and night. Explain that darkness happens when there is no light. We say it is the 'absence' of light. Explain 'absence' in terms of being absent from school – it's when you are not here. When light is absent it is not here, so we say it is dark. Ask what the classroom is like now. Is it light or dark? How can we make the classroom light? Look for answers that show an understanding that we must either let light through the windows or



they can appear really bright. Look again at the pictures and predict which objects might reflect light. Explain that when light bounces off reflective materials we can see them even in the dark.

Give each group a mirror to take into the classroom cave. Ask them to predict whether they will be able to see it in the dark – a prediction is a best guess about what will happen in a test or experiment based on what we already know. Is the mirror a light maker (a source of light) or a reflector (something that light bounces off really well)?

Compile trays with a selection of both shiny and dull objects and materials. Some should be good reflectors of light. Options include tinsel, metal cutlery, a plastic mirror, foil, fur fabric, black sugar paper, a mouse mat or a wooden ruler. Are these light sources? Do they make their own light? Prompt the idea that we could check by taking them into the cave.

Ask children to sort the objects into two groups: those they predict will reflect light and those that won't. Compare the groups. Do we all think the same thing? How could we test our ideas? Can we think of a rule to identify good light reflectors? Help children to conclude that smooth and shiny objects make the best reflectors of light.

 **WEEK 5**

Learning objectives:

- Make observations and simple comparisons of light reflectors
- Use knowledge of light reflectors to make a reflective badge

Ask children what it feels like to be outside in the dark in winter. Can they see other people very well? Bring in a bag or coat which has a reflective strip on it and ask children to think about why this might be a good idea when they walk home in dim light. Why do these reflective strips show up in dim light? Explain that it's because they reflect light from car headlights. Talk about other reflective objects that shine when light hits them. Remind children of the 'rule' they discovered earlier – shiny and smooth objects such as mirrors and foil are good reflectors of light. Remind children that a shiny object will not shine in the classroom cave as there is no light there.

Explain that you are going to make badges to help the children be more easy to see on dark evenings. Present a range

of materials – some reflective and others not – and allow them to design and make a reflective badge to pin on a bag. Discuss how they will decide which material to use. Provide access to torches if they choose to compare materials by shining light on them using their black box or the cave. Cut out school badge shapes then tape a safety pin to the back of the badge.



Assessment

Can children choose suitable materials and describe why that material will reflect light?

 **WEEK 6**

Learning objectives:

- Make observations and simple comparisons of materials
- Learn that some materials let light through

Remind children that they know that darkness is the absence of light – when there is no light it is dark. In the first lesson we learnt that even when it is light during the day we can make a room dark by covering the windows. Explain that some materials block light and stop it coming through. Blinds and curtains can stop light coming through windows and we wear sunglasses to reduce how much light enters our eyes. What other materials block light? How can we find out? Discuss with children how they might investigate which materials are best at stopping light.

Bring in an oversized pair of sunglasses. Discuss why we wear them and what the

lenses look like. Explain that we are going to make our own glasses – some will let lots of light through the 'lenses' and some won't let any through. Discuss what sorts of materials the children predict they can see through (that light will pass through).



Arrange a selection of materials, some transparent and some opaque. Help children compare how well the materials block light by testing whether light can pass through them to their eyes or not. Record the results as a class by ordering the materials in a comparative sequence, from 'blocks most light' to 'does not block any light'. Stick materials in order on a classroom window to provide an immediate 'check'. Download and print out the spectacles template [resource 5]. Children can glue their choice of lens onto this.

Explain that the sun is the most powerful and important source of light we have. It gives us light in the daytime and enables us to see things. Remind children that the sun is so bright that it can hurt our eyes if we look directly at it so we should never do this, even if we are wearing sunglasses (including ones we can't see through!). **TP**



Deborah Herridge is science subject leader for Initial Teacher Education at the University of Northumbria and co-author of Pearson's 'Science Bug' programme.