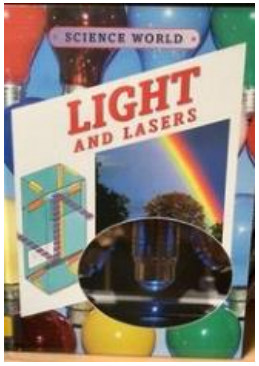
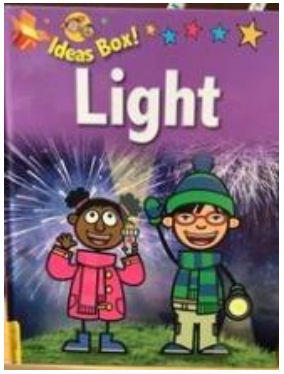
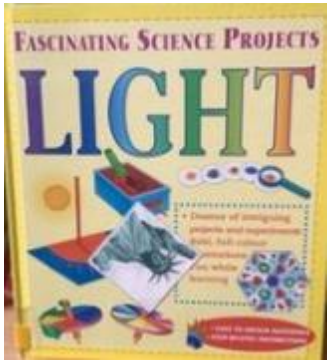
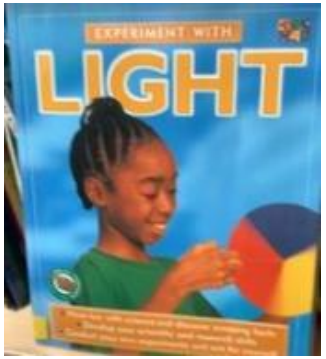
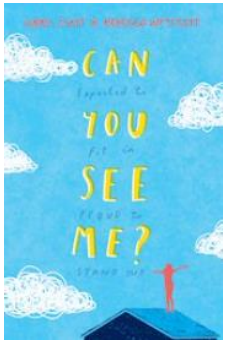
BILSTON CHURCH OF ENGLAND PRIMARY

MEDIUM TERM PLANNING

Subject	Topic/Key Question	Year Group	Term	Time Allocation
Science	Can you see me?	3	Autumn 2	18 hours
 Library	 Library	 Library	 Library	 Reading for pleasure boxes
End of lower Key stage 2 Outcomes	Asking relevant questions and using different types of scientific enquiries to answer them. Setting up simple practical enquiries, comparative and fair tests. Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.			

	Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. Identifying differences, similarities or changes related to simple scientific ideas and processes. Using straightforward scientific evidence to answer questions or to support their findings.
End of Unit Outcomes	I can recognise that they need light in order to see things and that dark is the absence of light. I notice that light is reflected from surfaces. I can recognise that light from the sun can be dangerous and that there are ways to protect their eyes. I can recognise that shadows are formed when the light from a light source is blocked by an opaque object. I can find patterns in the way that the size of shadows change.
Vocabulary	Light, see, dark, reflect, surface, natural, star, Sun, Moon, shadow, blocked, solid, artificial, torch, candle, lamp, sunlight, dangerous, protect, eyes.

Lesson Sequence	Time Allocation	Key Question/WALT	Teaching Activities Computing opportunities	Resources
Lesson 1	2 hours	WALT: investigate light and seeing. WILF:	**Working scientifically:** Setting up simple practical enquiries, comparative and fair tests.	Collins Connect - Snap Science

What do we need to see?		I can describe why we need light to see things. I can explain why it is harder to see objects when it gets dark.	Show the children a shiny object such as a piece of tinsel/shiny card and ask them: *Why can we see the tinsel/shiny card?* Compare to a brightly coloured object such as an apple, or brightly coloured ball *How can we all see the apple?* Look at something dark coloured and dull like a shoe. How can we see the show? Make sure that they all recognise that they can see all the objects. Encourage answers that refer to eyes, and light e.g. the blinds are up, the light is on. Tell children that the sun and the electric light are light sources, that this is where the light comes from. TTYP - Can you think of any more light sources? Hand out the true false cards (Resource sheet 1) and ask the children to talk about them and sort them into three piles: true, false or not sure. Give each group a selection of items – Which items will be easier to see and which ones will be harder to see? Children to hide an item in the show box and see through the hole (already cut out) – Can you see the object? How much can you see? What can we not see as much? (too dark) Repeat the experiment with the lid slightly off and think about the same questions. Repeat again, but with the lid slightly off shine a torch onto the box and think about the same questions.	A selection of items/materials – foil, tinsel, football, shiny card, black card, cotton, ruler etc. Show box with a hole cut out of the side Torches
Lesson 2	2 hours	WALT: investigate light and seeing.	**Working scientifically:** Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.	Collins Connect – Snap Science

Which is the shiniest?		WILF: I can describe how objects reflect light. I can suggest why some objects are areflect more light than others. I can explain what 'shiny' means.	Organise the children into groups and give each group a mirror and a torch. Explain that they are going to play a game to see what happens when they shine the torch onto the mirror. Ask them to use the mirror to move the beam of light around the room. Highlight the importance of doing this safely and not shining the light in anyone's eyes or face! Next, ask one child in the group to say where they want the beam to go. *What would happen if we didn't use a mirror but used something else to shine the torch onto?* Discuss with the class that whilst mirrors are good at 'bouncing off' (reflecting) light, not all objects are as good. Explore the word shiny with them. *What does it mean?* Agree with the class that we use the word shiny to describe how good something is at reflecting light. Hold up a selection of objects, e.g. a piece of foil, a CD and a piece of black card. Ask children to think about these items and about which of them would be best at reflecting light. Record predictions and will review them later. Children need to investigate different objects to see how they reflect light. Show children how to make a 'shininess tester', which they will use to investigate how shiny different objects are. Take a piece of black	Resource sheets 1 and 2 Collins Connect – Snap Science Slideshow 1 Mirrors and torches A variety of shiny and non-shiny materials/objects.

			card and fold it in half so it is open at about 90 degrees. Hold the card over an object on the table, put the torch quite close and shine it onto the object. Look to see how bright the reflection is on the card to help decide how shiny the object is. Record findings on writing frames – Resources 1 and 2 Children need to be able to explain why they think certain objects/materials were shinier than others. Reflect back on their predictions.	
Lesson 3 How can we make things easier to see at night?	2 hours	WALT: investigate light and seeing. WILF: I can explain why you cannot see anything if it is completely dark. I can make things easier to see at night. I can explain how my suggestions will make things easier to see in the dark.	**Working scientifically:** Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. What did we find out last lesson? Show children Slideshow 1 – What does it show? Discuss how some of the things in the slideshow make it easier to see – Think about what materials may have been used. Tell the children that it is very important to be seen when it is dark outside. If a person is travelling on a bike to work and it is very early or very late meaning it is dark outside, what could they do to make sure they are seen? Talk about reflective strips and how they work.	Collins Connect – Snap Science Resource sheet 1 Collins Connect – Snap Science Slideshow 1

			Look at the school bag – it has reflective strips on it – why do our school bags need reflective strips? Children to design a new school bag that as reflective strips or some other type of reflective design. Consider the reflective material they would use and explain why.	
Lesson 4 What do mirrors do?	2 hours	WALT: investigate light and seeing. WILF: I can describe how a mirror works. I can describe how images and words look different in mirrors. I can predict what an image or word might look like in a mirror.	**Working scientifically:** Using results to draw simple conclusions, make predictions for new values. What did we do last lesson? Remind children that mirrors are very good reflectors. Think about where you have used a mirror today and why you used it? Explain how mirrors help us see things we wouldn't be able to see normally – car mirrors help us see things as we are driving in places we wouldn't normally be able to see – driving round a bend. Children to look at the true and false statements – sort out which ones they are true or false then investigate using mirrors to check which ones are true and which ones are false. Sort the true and false statements again and explain why they have changed some or kept some the same.	Collins Connect – Snap Science Resource sheets 1, 2 and 3 Mirrors
Lesson 5	2 hours	WALT: investigate light and seeing. WILF:	**Working scientifically:** Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. Recap last lesson.	Collins Connect – Snap Science

How can I make a shadow?		I can recognise that shadows are similar in shape to the objects forming them. I can describe how a shadow is formed. I can explain using scientific language why some objects make better shadows than others.	Introduce children to the images of shadows on Slideshow 1. What words would you use to describe shadows? Introduce vocabulary - opaque (meaning blocks the light from passing through), transparent (lets nearly all the light falling on it to pass through) and translucent (blocks some of the light passing through it). The main aim of the lesson – How can I make a really good shadow? Can use shadow instructions activity sheet – Resource 2. Children to conduct the experiment in small groups. Children to use the torch and items given to find out how to make the best shadow. Children can work through activity 1 (shadows in the room) first to give them an idea of what they need to do - Resource 2. Children must record their investigation a they work through the challenges. Wat did you find out? Why do you think that made the best shadow?	Resource sheets 1 and 2 Collins Connect – Snap Science Slideshow 1 Torches Items/material – opaque/translucent and transparent - enough for one of each for each group Black card or an object for shadow
Lesson 6 Can you change the shape of a shadow?	2 hours	WALT: investigate light and seeing. WILF: I can explain how a shadow is formed.	**Working scientifically:** Identifying differences, similarities or changes related to simple scientific ideas and processes.	Collins Connect – Snap Science Resource sheets 1 and 2

		I can describe how I can make the size of a shadow change. I can predict what will happen to the size of a shadow when I move the light source or the object making the shadow.	Recap last lesson – what made the best shadow and why? Recap – vocabulary – transparent, translucent and opaque – what do they mean? Start by making a shadow as a class. Discuss – How can we make the shadow move? What will happen to the shadow if I move the torch? Children can conduct experiment outside and use IPads to take pictures of their shadows if the weather is nice and the sun is out. Children to draw a shadow on big paper. Move the torch or object and draw the shadow again – what happens? Why do you think that happens? Allow children to explore with shadows. Children should be able to start talking and describing how shadows are formed.	IPads to take pictures of shadows Large paper Coloured felts Torches
Lesson 7 How can you change the size of a shadow?	2 hours	WALT: investigate light and seeing. WILF: I can explain how a shadow is formed. I can describe how I can make the size	**Working scientifically:** Identifying differences, similarities or changes related to simple scientific ideas and processes. What did we learn about shadows last lesson? Show images on Slideshow 1 – what made the shadows? How do you know?	Collins Connect – Snap Science Resource sheet 1

		of a shadow change. I can predict what will happen to the size of a shadow when I move the light source or the object making the shadow.	Hold up a piece of black card between a torch and a wall/screen. Ask the children to draw what they think the shadow might look like. Switch the light source on – Were you correct? Does your drawing of the shadow look like the one you can see? TTYP - What do you think will happen if I move the piece of card closer to the torch? Feedback responses. Repeat the experiment by moving the black card closer to the torch. Do you think this will happen with other objects? Give each group a variety of objects and a torch – experiment. What shadow shape does each object make? What happens when you move them closer or further away from the light source? Children to make predictions for each object before having a go then conduct the experiment. Write what happens for each object. Use resource sheet 1 **Challenge 1:** Children draw and record how shadow shapes and sizes change Ask children to draw a shadow shape for at least one object. For different objects ask the children to predict what will happen if they move the object towards/away from the light source. Ask them to	Collins Connect – Snap Science Slideshow 1 Torches Black card A variety of different objects

			record their prediction and then to test what happens for several objects. D*o you think this is true for all objects?* Get the children to write two or three sentences to say how we can change the size of a shadow. **Challenge 2:** Children explore how shadow shapes and sizes change and write a conclusion Confirm that children can confidently draw shadows for each object. For different objects ask the children to predict what will happen if they move the object towards/away from the light source. Get the children to record what happens to the size of the shadow when they move the object towards or away from the screen. *Do you think this is true for all objects? Does the object get taller/shorter as well as wider/narrower? How might you find out?* Ask the children to write a conclusion to explain their findings using comparative language. **Challenge 3:** Children measure how shadow shapes and sizes change and record their results using a table This builds on Challenge 2, and children should be encouraged to measure the distance between the light source and the object and if possible the size of the shadow. Record their results in a two column table. *What differences in the size of the shadow do you notice? Is there a pattern to the changes/measurements?*	

			Ask the children to write a conclusion to their investigation based on their evidence and to propose a 'scientific law' about the way the size of a shadow can be changed.	
Lesson 8 What makes the best sunglasses?	2 hours	WALT: investigate light and seeing. WILF: I know that light from the sun can be dangerous to my eyes. I can plan an investigation to test different sunglasses. I can record my data.	**Working scientifically:** Setting up simple practical enquiries, comparative and fair tests; making accurate measurements using standard units, using a range of equipment, for example thermometers and dataloggers. Recap last lesson. We have been looking at light and shadows, but if we are out in the sun and it is bright we need to protect our eyes. What can we do to protect our eyes? (sunglasses) - can look at images in Slideshow 1 TTYP – What materials would make the best sunglasses and how do you know? Think about what we have found out about different materials. Discuss • Would opaque sunglasses be good? Why/Why not? • Would translucent sunglasses be good? Why/Why not? • Would transparent sunglasses be good? Why/Why not? Think about what material is best for the lenses? Get children to think about how it needs to block some of the light but you should still be able to see.	Collins Connect – Snap Science Data Loggers Collins Connect – Snap Science Slideshow 1 Resource sheet 1

			Children to use data loggers to record how much light each piece of material lets in. Children to test each material and record their findings – differentiate. Conclusion – Which material would you use for sunglasses and why? Which material could you still see through, but blocked out some light?	
Lesson 9 Making sunglasses.	2 hours	WALT: investigate light and seeing. WILF: I can explain how sunglasses can protect us from the sun. I can explain why we need to protect our eyes from bright lights especially the sun.	**Working scientifically:** Reporting on findings from enquiries, including real and written explanations, displays or presentations of results and conclusions. Recap – What did we find out last lesson? Using the information, you found out last lesson you are going to create a poster advertising your own sunglasses – tell everyone what material they're made from and why (you found this out last lesson) Challenge 1: Children create a poster explaining how their sunglasses kept them safe Give children the poster checklist (Resource sheet 1). The children can use this checklist to help them produce a poster advertising their sunglasses. Ask them to add an explanation of how the sunglasses keep them safe. Challenge 2: Children create a poster explaining and evaluating their sunglasses Ask children to produce a poster advertising their sunglasses, including an explanation of how the	Collins Connect – Snap Science Resource sheets 1 and 2 Work from last lesson Materials from last lesson IPads – Pic Collage to create a poster.

			sunglasses keep them safe. They should describe how they tested the sunglasses and include information about how they could be made even better. Challenge 3: Children create a poster explaining how their sunglasses work, including a description of what happens to the light.	