

Earth and Space: Lesson 3

Shadows

Science KS2 Year 5



Earth and Space: Lesson 3

Science

Key Stage 2 Year 5

Learning Aims:

- understand how shadows are made
- understand why shadows change
- observe shadows at different times of the day
- show understanding with a diagram

Curriculum Links:

Pupils should be taught to:

- describe the movement of the Earth and other planets relative to the Sun in the solar system
- describe the movement of the Moon relative to the Earth
- describe the Sun, Earth and Moon as approximately spherical bodies
- use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky

Year 5 and 6 Working Scientifically

- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs

Keyword Vocabulary

Shadow. Opaque. Transparent. Two-dimensional. Three-dimensional. Silhouette. Sundial.

These can also be found at the end of this PDF in printable format for the working wall.



This lesson explains how shadows are formed. It consolidates children's knowledge about the Earth's orbit creating day and night and demonstrates that this is why shadows outside appear to move throughout the day. The previous lesson introduced the sundial; in this lesson children put this into practice by measuring shadows at a fixed point throughout a set amount of time during the day. You may wish to download iChild's sundial craft: Make a Sundial Craft.

<http://www.ichild.co.uk/activities/view/6kRrs9N85gUleDZTPLgcjs/Make-a-Sundial>

The worksheet is on pages 5 and 6 of this PDF.

PowerPoint Presentation

The accompanying PowerPoint has the following learning points:

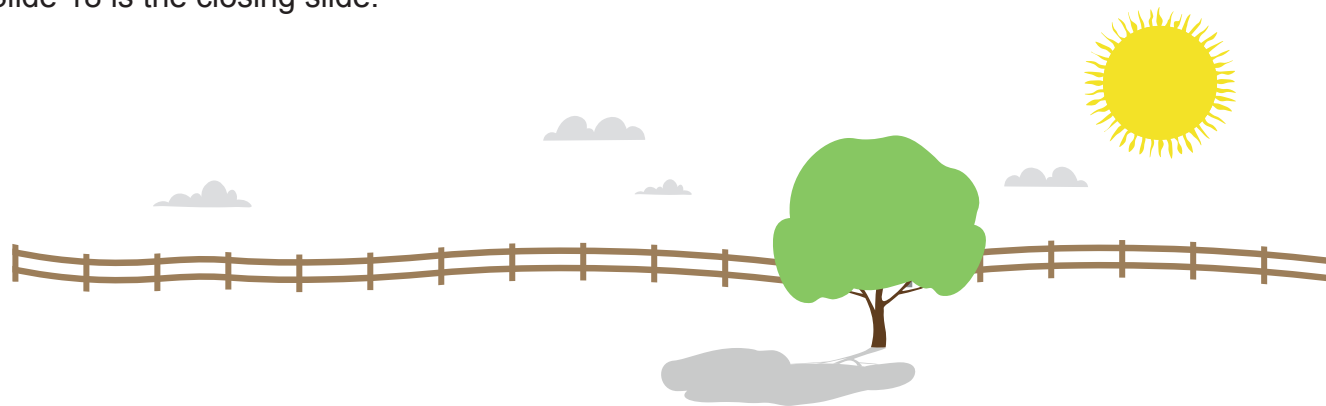
- Slides 1 and 2 introduce the lesson.
- Slide 3 asks the children to describe a shadow and displays 3 images of shadows: one cast by a tree, one cast by a plane as its path crosses the sun, one cast by hand in torchlight. This is an opportunity for children to share their thoughts and ideas.
- Slide 4 displays the same images with the explanation that a shadow is caused when an opaque object blocks light from a light source.
- Slide 5 demonstrates an open sunlit field. There is nothing there to cast a shadow.
- Slide 6 demonstrates a tree casting a shadow, and explains that the tree is casting the shadow because the light cannot pass through it.
- Slide 7 shows a glass French window with slatted blinds, and demonstrates that the transparent glass does not cast a shadow, whereas the blinds do.
- Slide 8 describes the properties of a shadow: firstly it is a two-dimensional silhouette. You may wish to recap the meaning of two-dimensional.
- Slide 9 continues the description of the properties of a shadow: covers all of the three-dimensional volume behind the object that is blocking the light. You may wish to reinforce this by demonstrating a shadow cast over a certain volume (perhaps a desk and torch), and then adding a further object (perhaps some books).



- Slide 10 asks the children what is needed to cast a shadow. You can give them time to tell you the answer before the slide displays the first half of the answer: light.
- Slide 11 displays the second half of the answer: an object to block the light.
- Slide 12 reinforces that the sun is our biggest source of light, and reminds children never to look directly into it.
- Slides 13 displays shadows at different positions throughout the day, and consolidates their understanding that this is caused by the Earth's orbit around the sun.

Activity

- Slides 14, 15 and 16 introduce the activity: children will use the sundial to measure a shadow throughout the day. With the children, decide how the shadows will be measured, what unit of measure they will use, how often they will measure and how they will record their results.
- Slide 17 recaps what the children have learned.
- Slide 18 is the closing slide.



Measuring shadows



Time	Length of shadow
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Measuring shadows

What do your results show about how shadows change throughout the day?

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What causes this change?

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Earth and Space: Keywords Flashcards



Shadow

Opaque

Transparent

**Two
-dimensional**

**Three
-dimensional**

Silhouette

Sundial



Shadow



Opaque



Transparent



Two -dimensional



Three -dimensional



Silhouette



Sundial

