

Year 4

Light and shadow/circuits and switches: activity ideas

- 1** Design and make a sundial. As with the Year 3 activity, fix a stick to a base and place it in a sunny spot. Each hour, return to the stick and mark the position of the shadow on the base and the time. Measure the angle between each shadow using a protractor. Each angle should be approximately 15 degrees. The Earth rotates 360 degrees in 24 hours, so that's 15 degrees each hour. Use this information to challenge the children to design and make a sundial.
- 2** Set up a sundial and test it throughout the day by comparing the time shown on the sundial with the time shown on a clock. Carry out research into sundials using books and the internet. Discuss the limitations of using sundials. Look at the design of the faces and how modern sundials are still produced, usually as decorative features. Link to maths work on angles, measuring and telling the time using different types of clocks.
- 3** As a class, study how artists make use of light and shadow in their work. Use the internet and reference material to explore landscapes or portraiture. Challenge the children to adopt the techniques of professional artists in their own work, by focusing on the use of shadow and brighter and darker colours. Set up a still life using a lamp or torch to provide light from different directions. Encourage the children to move the light and observe how it changes the appearance of the objects. The same objects can then be drawn or painted with different areas of light and shadow, to create different effects.
- 4** Draw a picture/diagram showing the movement of the Sun across the sky and the shadows that are produced.
- 5** Go out into the school grounds and establish the directions of north, south, east and west using a compass. Each morning and afternoon, go outside with a compass and observe the direction from which the Sun appears to rise and in which it appears to set. Establish that it is the same each day. Ask children to explain why they think this is.
- 6** Use digital photography to explore light in images. Take photographs of the same objects or areas at different times of the day or in different weather conditions. How does the change in light affect the photograph? Take photographs with and without the camera flash. What effect does this have?
- 7** Set up a photographic studio with lighting that can be changed and manipulated. Angle-poise lamps would be ideal. Allow the children to take still-life photographs, adjusting the lighting to achieve different effects. Take portrait photographs of each other, moving the lighting to create and prevent shadows. Stage an exhibition of the children's photography or mount their work in a book.
- 8** Ask the children to apply their knowledge about switches and circuits to fulfil specific tasks. For example, design and make a circuit so that an alarm will sound if a secret diary is opened, or if a valuable object is removed.

