Y3 - Light

Lesson 4

Lesson	4 of 6

Key Unit Question:	What is light?

Key Lesson Question:	What is a shadow?

Learning Objective

- I can recognise that shadows are formed when light from a light source is blocked by an opaque object.
- I know that shadows take on the shape of the opaque object.
- I can predict where a shadow will form in relation to an opaque object and a light source.

NC Links

Y3

- Recognise that shadows are formed when the light from a light source is blocked by a solid object.

Resources

- Shadow PP
- A variety of objects that are opaque, transparent and translucent (e.g. tissue paper, book, wooden block, teaspoon, bubble wrap, sheet of plastic, tracing paper, foil)
- A torch (1 per group)
- Differentiated activity sheet (easy, medium)
- Challenge activity sheet
- Next step activity sheet

Teaching Input

- Use PPT slide 1/PDF title page to introduce the learning objective.
- Recap on previous learning; what is a light source? What is reflected light and how do we see objects. Remind the children that dark is the absence of light.
- Thinking time. What happens when an object blocks the light travelling in straight lines? Discuss it in pairs. As a class, discuss ideas and theories.
- Use PPT slide 4/PDF p3 to explain that a shadow is made when an object blocks light. A shadow is a dark area or shape caused by a solid object blocking the rays of light from a light source.
- Before you turn to PPT slide 5/PDF p4, ask the children does light travel through all objects? Take a vote, yes/know/not sure. Using slide 5, Introduce the terms opaque, translucent and transparent. Look at objects around the classroom, which are opaque, transparent or translucent? Teach the children that, for a shadow to form, the object must be either opaque or translucent.
- Mini – experiment. Using a torch or a projector and a blank wall, ask a child to place their hand in front of the light source. Where will the shadow form? What shape will the shadow be? Why is the shadow there? Explain that a shadow is the area where no light (or very little light) is and that's why shadows are dark in colour (as there is no or very little light) as the opaque object (the child's hand) is blocking the light. Also use this as an opportunity to reinforce the idea that light doesn't bend round corners and fill the space. What time of year/what sort of weather days do you see your own shadow out on the playground? Why is this?
- Use PPT slide 6/PDF p5 to reinforce the teaching from the previous mini-experiment.
- Introduce the activity (task). Don't worry about elements of fair testing at this stage; children should have lots of experience testing various materials and identifying if they opaque, translucent or transparent and then making predictions about what sort of shadow will be produced.
- After the children have completed the activity, ask them to read the questions on PPT slide 8/PDF p7 and be prepared to share their ideas in a group plenary/discussion. Ask the children what is a shadow?

BACKGROUND SCIENCE FOR TEACHERS:

Light can travel through an empty space but when it comes into contact with an object, different things might happen depending on the material the object is made from. A transparent material (such as air or thin glass) will allow the light to go straight through with little disturbance. A translucent material (frosted glass, tracing paper) will allow light through but not straight through. The light ray will be deflected and diffused (broken up) by the translucent material so although the light does pass through, it is so altered that you are unable to make a distinct image. Opaque material (like wood or metal) allows no light to pass through. A shadow is formed when an opaque object is placed between a light source and a surface; the shadow falling on the surface has the same shape as the opaque object.

Differentiated Activities

⭐ (working below)

1. Children investigate a variety of materials (translucent, opaque and transparent) to find out which objects make the best/worst shadows. They record their findings in the table at the top of the activity sheet (easy)
2. Using the information gathered in their tables, children then draw conclusions about which type of materials make the best and worst shadows and explain why.
3. Children then draw a diagram to show how they set out objects to spell out a shadow word.

⭐⭐ (working at)

1. Children investigate a variety of materials (translucent, opaque and transparent) to find out which objects make the best/worst shadows. They record their findings in the table at the top of the activity sheet (medium)
2. Using the information gathered in their tables, children then draw conclusions about which type of materials make the best and worst shadows and explain why using scientific language.
3. Children investigate what happens to the shadow when they move the torch around.
4. Children then draw a diagram to show how they set out objects to spell out a shadow word.

Challenge activity

Children predict what the shadow will look like on the diagram using knowledge gained from the investigation. Encourage the children to think about the position of the shadow in relation to the object and light source; the size of the shadow and the shape of the shadow. The base of the shadow should also be touching the base of the object (there will be no gap in-between).

Next Step activity

Critical thinking activity- what would happen to the person's shadow if the light source was moved? This activity focuses children's understanding of where the shadow forms in relation to the opaque object and the light source. Children should also be encouraged to start to think about the size of the shadow if the light source is moved closer or further away.

Assessment questions

- What is a shadow?
- Do all objects make shadows when placed in front of a light source?
- What do the words transparent, translucent and opaque mean?
- Can you name some transparent,

Self assessment

- I can explain how a shadow is formed.
- I can recognise opaque, transparent and translucent materials and predict which objects will make the best shadows.

Key vocabulary

- Shadow
- Opaque
- Translucent
- Transparent
- Block