

Brontosaurus Learning

Making science fun!

An Experiment about

Light Shadows



What you will need:

- A torch or flashlight
- A variety of different shaped objects

What you will do:

- 1 Make the room dark.
- 2 Choose one item to investigate and put it in the middle of the table.
- 3 Shine the light on it from different directions—the front, the side, the back, the top. *How does the shadow change?*
- 4 Now try different angles and distances. *What happens when the light is shining down onto the object? Is it different to shining straight at it? What about if the light is further away?*
- 5 Experiment with different objects and see what is the same and different about them. *Think about where the light is going.*

What is going on?

Light travels in a straight line unless something gets in its way. If an object is transparent, or see through, it is because light can travel through it. If an object is solid, light cannot travel through it so a shadow is formed where the light has been stopped.

The shape and size of a shadow is determined by the shape of the object and the distance and direction the light is travelling in. What patterns did you notice in your experiment?

Challenges:

- Check your shadow at various times of the day. Can you spot a pattern in how it looks? Why do you think this is?
- Have a go at shadow puppets. There are lots of amazing shadow puppet performers in the world, some who use their hands to make shapes and others who use cardboard puppets. Research some of the different types of shadow puppets.



TEACHING NOTES:

Brontosaurus Learning Science Experiment:
Light L11

Topic: Light

Key Concepts:

- ◆ How shadows are formed

Resources:

- Investigation Record IR01– one copy per student
- Experiment Description Light L11 – one copy per student
- Flashlight and a variety of objects of different transparency and shapes

Lesson Notes:

Remind students to listen carefully to instructions, and to OBSERVE their experiment.

As a class discuss the experiment prior to undertaking it, and students should complete the sections of their Investigation Report IR01 from "Title to "Hypothesis".

Students should be encouraged to freely investigate the different objects but also to discuss and make notes of their observations.

What should happen in this experiment, and why?

Shadows are formed when light is stopped from travelling through a solid object. The size and shape of the shadow is affected by the amount of light travelling around the object, the angle of the light source and its distance from the object. Lower angles, for example, produce longer shadows.

Follow up discussion questions:

- Has anyone already noticed something about shadows?
- When the light hits the solid object, where does the light go? [some is absorbed and some is reflected]

Flashlight image from Freepik

Investigation Record



Experiment Title:

Scientist (that's you!):

Materials: What will I need?

Investigation—what am I going to do in this experiment?

Diagrams are a great idea!

Hypothesis: What I think will happen:

Observation: What I SAW happen:

Diagrams are a great idea!

From my investigation I learnt:

Great work scientist!