

Nova's Nocturnal Light Lab

Learning objective: To identify light sources, understand how light travels, and explain how shadows are formed.

Nova the owl is studying the night sky. To help her, sort the following items into 'Light Sources' or 'Reflectors'. Then, answer the scientific questions below to demonstrate your understanding of light and shadows. Remember, a light source produces its own light, while a reflector only bounces light back to our eyes.

Word bank: Light source · Reflector · Transparent · Opaque · Translucent · Shadow · Straight line

1. Sort these items: The Sun, a shiny metal spoon, a lit candle, the Moon, a torch, and a polished mirror. Explain why a mirror is not a light source. (4 marks)

2. Light travels from a source to an object. Explain why we cannot see an object in a completely dark room. (2 marks)

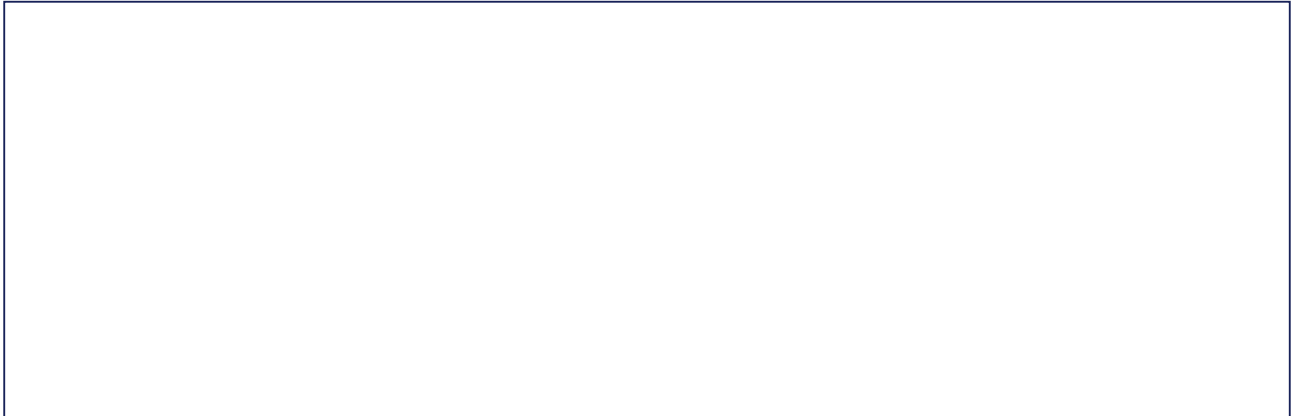
3. Nova places a piece of card between a torch and a wall. Describe the shadow that appears. Justify your answer using the term 'opaque'. (3 marks)

4. Compare and contrast a transparent window and a translucent piece of tracing paper. How does each affect the light passing through? (3 marks)

5. What might happen to the size of a shadow if Nova moves the torch closer to an object? Explain your reasoning. (2 marks)

6. If you were designing a shelter to keep a room cool during a sunny day, would you choose transparent, translucent, or opaque materials for the roof? Justify your choice. (2 marks)

Draw: Draw a diagram showing a torch shining light onto a ball. Include arrows to show the path of light and draw the shadow that would form on the wall behind the ball.



Extension challenge: Nova wants to conduct an experiment. Design a fair test to investigate which materials create the darkest shadow. List the variables you would keep the same to ensure your results are accurate.