

Light

Light, shadows & reflection



1. Where does light come from, and why do we need it to see?

Light comes from a **light source**, like the sun, a lamp or a candle.

- We see objects because light bounces off them into our eyes.
- Without any light source, it is completely dark and we cannot see.

3. How does light reflect off shiny surfaces?

Reflection is when light bounces off a surface, like a mirror.

- Smooth, shiny surfaces reflect light much better than dull, rough ones.
- Reflective strips on clothing help drivers see people in the dark.

Reflective Materials

Reflective materials have smooth, shiny surfaces that bounce light back.

Mirror	Aluminium Foil	Polished Metal	Still Water	Glass	Disco Ball
Mirrors reflect most of the light.	Shiny aluminium foil reflects a lot of light.	Polished metal surfaces are very reflective.	Still water reflects light like a mirror.	Glass can reflect some of the light.	Disco balls reflect light in many directions.

Key idea: Shiny, smooth surfaces reflect light. Dull or rough surfaces do not reflect much light.

5. How does shadow size and shape change with the light source?

Moving the light source closer to an object makes the shadow **bigger**; moving it further away makes the shadow **smaller**.

- Changing the angle of the light changes the shadow's shape and direction.
- This is why our shadows change through the day as the sun moves.

6. Greater Depth: why do shadows change throughout the day?

As the sun's position changes across the sky, the angle of sunlight changes too.

- Shadows are long in the early morning and evening, short at midday.
- Recording shadow length at different times reveals this daily pattern.

Light Sources - Examples

Natural Light Sources				Artificial Light Sources			
Sun	Stars	Lightning	Fireflies	Light Bulb	Candle	Flashlight	Neon Sign

2. Why must we never look directly at the sun?

The sun is so bright it can **permanently damage** our eyes.

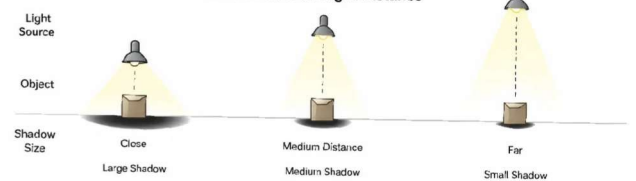
- This is true even when it's cloudy or through sunglasses.
- Light safety is an important rule in every light investigation.

4. How are shadows formed?

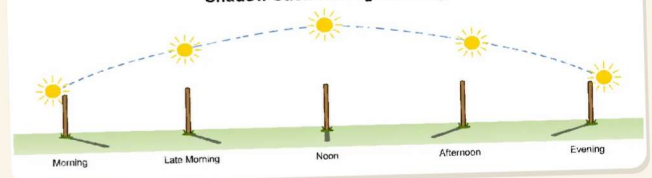
A **shadow** forms when an opaque object blocks light travelling in a straight line.

- Because light travels in straight lines, the shadow copies the object's outline.
- Transparent and translucent objects let light through and cast little or no shadow.

Shadow Size vs. Light Distance



Shadow Stick Through the Day



7. TAPS: How do we write up our shadow-length investigation?

FAIR TEST

Our TAPS test: **how does the distance between object and light source affect shadow size?** It's a **fair test** — we change only the distance and keep the object and light source the same.

- Question → **prediction** → variables (change / keep same / measure).
- Materials → **method** → carry out the test → **results** → **conclusion**.

Torch Position (distance from ball)	Diagram	Shadow Size (width in cm)	Shadow Size (height in cm)	What we noticed
10 cm		4.0 cm	6.0 cm	Small shadow
20 cm		8.0 cm	12.0 cm	Bigger shadow

KEY VOCABULARY

light source reflect shadow opaque transparent translucent straight line angle
distance fair test predict conclusion

SKILLS I'LL USE

- Set up a simple fair test
- Measure length in centimetres
- Record results in a table
- Observe patterns over time
- **GD:** explain shadow patterns using light travelling in straight lines