

Lesson 20 • energy-forces

Light: sources, reflection and how we see**Lesson at a glance**

Open by asking whether light leaves the eye or arrives at it — tally guesses, no correction yet. Name transparent, translucent and opaque, then groups test clear plastic, tracing/greaseproof paper, thick card and thin fabric in a torch beam and bounce the beam off a mirror to a sticky-note target, recording on the Investigation Journal page. Drive the light-rays interactive so the class follows torch → mirror → eye. Close by settling how we see from the evidence.

Learning objectives

- Classify materials as transparent, translucent or opaque by testing them with a torch
- Explain that we see when light travels to the eye, and that light can bounce off mirrors

Before the bell – prep

Night before: one torch, one small mirror and a material set (clear plastic, tracing or greaseproof paper, thick card, thin fabric) per group. Stick one sticky-note target on a wall or cupboard per station. Print Investigation Journal pages. Foil-on-card substitutes for a missing mirror. Dim lights if you can.

Materials

Item	Qty	Per	Source	Low-cost substitute
battery torch	1	group	school kit	one class torch passed between groups, or a phone torch held only by the teacher for shared tests
small flat mirror	1	group	school kit	aluminium foil stretched smooth and taped flat onto stiff card
transparency test set (clear plastic wallet or sheet, tracing or greaseproof paper, thick card, thin fabric scrap)	1	group	classroom	clear food bag, baking paper, cereal-box card, scrap of cotton from home
sticky-note or small card target for the wall	1	group	classroom	a chalk mark or a piece of masking tape on the wall
Investigation Journal page	1	pupil	classroom	ruled paper with a simple materials results table drawn by the pupil, plus space for a mirror note

Safety watch-point

Torches never aimed at eyes or faces; mirrors held low; no running with glass mirrors. Use foil-on-card if a glass mirror is missing.

Teaching moves

- **Getting Started:** Keep it curiosity-only — no kit out. Tally hands on ‘light leaves the eye’ vs ‘light arrives’. Note the eye-beam idea calmly and say the class will test it today; do not correct yet.
- **Words for light:** Spend about five minutes on the three material labels only. Optional hold-up: clear plastic vs thick card and ask which label fits. Hold reflection and how-we-see until after the bounce and interactive.
- **Investigate light:** Model one full cycle aloud with clear plastic, then one safe mirror bounce to the sticky note and name reflection. Hear two spoken group predictions, then release. Circulate asking what stayed the same each test; stop any torch aimed at faces.
- **Record our results:** This is finish-and-check, not rewrite from memory. Look for two materials with a reason tied to the wall patch, plus whether the bounce hit the target and that tilting moved the spot. Early finishers sketch torch → mirror → target.
- **Follow the light to the eye:** Drive the light-rays interactive in explore mode on the mirror-to-eye scene. Start near 45°, take a spoken prediction, turn the dial, repeat steeper and shallower. Narrate: light leaves the torch, bounces, enters the eye — nothing leaves the eye.
- **How do we see?:** Display-only talk on the focus question. Draw out the need for a source, the mirror only redirecting light, and the ray ending at the eye. If eye-beams linger, ask what happens in a fully dark cupboard with eyes open.

What it should show

Clear plastic reads transparent (sharp bright patch); tracing/greaseproof translucent (glow, fuzzy view); thick card opaque (dark patch). Thin fabric may go either way if justified by the wall. Mirror bounce hits the sticky note once tilted. Odd ‘opaque’ on clear plastic usually means the beam missed the sample or the room is too bright — cup the torch or use a shaded corner.

Misconceptions & interventions

- **‘My eyes send out beams so I can see’ — the cartoon eye-beam idea.** — Point to the interactive path ending at the eye and ask what a fully dark cupboard would look like with eyes open. Stress we need a source or a bounce for light to arrive.
- **Pupils mix transparent and translucent — both ‘let light through’ so they sound the same.** — Hold clear plastic and tracing paper side by side in the beam: sharp view of the wall mark vs glow with no clear picture. Tie the label to what they see, not to ‘some light’ alone.
- **‘The mirror makes light’ or creates the bright spot by itself.** — Switch the torch off with the mirror still aimed — the spot vanishes. Say the mirror only changes the light’s direction; the torch is the source.

**Differentiation**

Emerging	Developing	Proficient
• Start with thick card vs clear plastic only, then add tracing paper; teacher models the journal sentence stem beside them. • Pair at the teacher table for the first bounce so torch aim stays safe and the sticky-note hit is shared.	• Add thin fabric as a discuss-and-justify material and write why the wall patch earned that label. • Prompt: what stayed the same in every material test?	• If kit allows, try a second bounce with two mirrors in a chain and sketch the longer path on the journal page. • Critique another group's material reason: does it match sharp, fuzzy, or blocked light on the wall?

Cross-curricular hook

Link to road safety: reflective strips on coats and bike pedals bounce headlamp light back to a driver's eyes.