

Light: colour and the spectrum

Lesson at a glance

Open by comparing a dark jumper and a pale shirt in sunshine and ask whether light only helps us see. Pupils predict, then feel dark and pale cards left under one shared warm lamp or on a sunny sill. A teacher demo splits white light through a prism or water tray onto white card; groups then spin pre-made spectrum colour wheels and watch the blur. They record spectrum colours, wheel result and card warmth on the ObservationSheet, then close with a talk that white light holds colours and carries energy.

Learning objectives

- Identify natural and artificial sources of light and show that light carries energy
- Split white light into a spectrum and describe the colours seen
- Show that a spinning mix of spectrum colours can blend back toward pale white

Before the bell – prep

Pre-colour spectrum wheels on card or paper plates the day before — no colouring in the lesson. Gather one dark and one pale card, white card for the spectrum, and either a glass prism or a shallow water tray with a small mirror. Prefer a sunny sill or one shared warm (incandescent/halogen) lamp; cool LEDs rarely show a warmth difference.

Materials

Item	Qty	Per	Source	Low-cost substitute
dark card (A5 or similar)	1	group	classroom	black sugar paper or the back of a dark book cover
pale or white card (A5 or similar)	1	group	classroom	plain photocopy paper
warm desk lamp (incandescent or halogen) or access to a sunny windowsill	1	class	classroom	one shared warm lamp at the front for a whole-class card comparison; cool LED lamps alone are a weak substitute for feeling warmth
glass prism	1	class	school kit	shallow water tray with a small mirror, or a clear glass of water and strong torchlight onto white card (teacher demo first)
torch	1	class	school kit	phone torch held by the teacher only
white card for catching the spectrum	1	class	classroom	plain A4 paper
card or paper-plate colour wheel (spectrum segments already coloured in)	1	group	classroom	a paper plate divided into coloured segments with markers, prepared the day before
pencil or split pin for spinning the wheel	1	group	classroom	a short straw and a blob of sticky tack as a simple spinner pivot
shallow water tray and small mirror (if no prism)	1	class	classroom	skip if a prism is available; one teacher demo tray is enough for the class
coloured filters or coloured cellophane (optional extension only)	2	class	school kit	skip filters in the core lesson; coloured sweet wrappers washed and dried if used as a quick teacher demo only

Safety watch-point

Never look at the sun or into a bright lamp; no touching hot bulbs or shades; never shine torches into faces; steady hands with glass and water, wipe spills; mind split pins on wheels.

Teaching moves

- **Getting Started:** Hold up a dark card and a pale card, or point to jumpers in the room. Ask where light comes from on a bright Irish day versus a grey classroom afternoon. Collect sun as natural and lamp/torch/screen as artificial — keep it brief and leave the kit packed away.
- **Light that carries energy:** Project only the short board line on light energy. Model the prediction aloud: dark card should feel warmer because dark surfaces take in more light energy. Hold white-light and spectrum language for the split step.
- **Do dark and pale cards warm differently?:** Place both cards side by side under the shared warm lamp or on the same sunny sill. Take whole-class predictions before anyone touches. After about five minutes, pupils compare with the back of the hand. If both feel the same, say so honestly and revoice that light still carries energy even when the difference is small.
- **Split white light into a spectrum:** Guarantee one clear whole-class spectrum first with the best kit you have before any group tries. Predict: if white light is only white, what lands on the card? Once the band is visible, name white light and spectrum, then open the light-rays interactive on the prism scene as confirmation only. Tell Newton's prism story in under a minute.
- **Spin the colour wheel:** Spin one pre-made wheel yourself first so the class sees the blur target, then every group spins theirs on the desk or between palms. Look for a pale grey-white or muddy white, not pure white. Skip filters unless spare minutes remain — protect the wheel slot.
- **Record the colours and the wheel:** Issue the ObservationSheet. Circulate with three prompts only: colours you actually saw, what the fast wheel became, which card felt warmer. Accept honest drawings and short notes — no layout rewrite.
- **Make sense together:** Partner talk then class share. Revoice three links: darker card warmer means light carries energy; prism band means white light is a mix; spinning wheel toward pale white means the colours belong together. If someone says the prism paints colours on, return to: the colours were already inside the white light.

What it should show

Dark card often feels slightly warmer under strong sun or a warm lamp; cool LEDs may show no difference — still valid if the talk is honest. Spectrum shows a band with red at one end and blue-violet at the other; not every named ROYGBIV colour will be clear. Fast wheel blurs toward pale grey-white or muddy white, not pure white.



Misconceptions & interventions

- **Pupils say the prism or water 'paints' or adds colours onto the light.** — Point back at the real band and revoice Newton's idea: the colours were already inside the white light; we only spread them out. The spinning wheel blending toward pale white is the reverse evidence.
- **Pupils think light only helps us see and does not do any other job.** — Return to the card test: 'What did the back of your hand feel?' Link the warmer dark card to light carrying energy that a surface can take in.
- **Pupils expect the spinning wheel to become a perfect pure white and reject a grey or muddy blur.** — Hold up a fast-spinning wheel and name what they actually see. Affirm that moving toward pale or grey-white is the honest result and still shows the spectrum colours belonging together.



Differentiation

Emerging	Developing	Proficient
• Let pupils report the card test as warmer / cooler / about the same, and name only the spectrum colours they clearly saw from the shared teacher demo. • Pair at the teacher table for the wheel spin and scribe one short observation sentence with them.	• Prompt why the dark card took in more energy, and ask them to list spectrum colours in the order they appeared on the card.	• Ask them to explain how the spinning wheel is the reverse of the prism split, and to link a rainbow after Irish rain to sunlight split by water drops.



Cross-curricular hook

Link to Irish weather and Geography — rainbows after rain are sunlight split by water drops, the same spectrum idea.

