

Lesson 9 • materials

Choosing the right material for the job

Lesson at a glance

Open by holding up a paper bag and a plastic bag and asking which would keep books dry in Irish rain, and how we could test that fairly. Name the four testable properties, then model a short waterproof check on foil. Groups predict, then test fabric, plastic, foil and card for waterproofness, strength, flexibility and transparency, ticking pass/fail on the Investigation Journal comparison table. They recommend a material for a rainy book cover and a greenhouse window panel using their evidence.

Learning objectives

- Test materials for waterproofness, strength, flexibility and transparency
- Recommend a material for a given job and justify the choice from the evidence

Before the bell – prep

Cut four same-size samples per group the day before: fabric, plastic sheet or bag, aluminium foil and card. Set one water tray, dropper or teaspoon, dry underside-check paper and a scrap of printed paper per group. Label sample trays so groups do not mix materials.

**Materials**

Item	Qty	Per	Source	Low-cost substitute
cotton or mixed fabric samples (about 10 cm squares)	1	group	classroom	scrap from an old clean tea towel or T-shirt brought from home
clear plastic sheet or bag samples (about 10 cm squares)	1	group	supermarket	pieces cut from a clean food bag
aluminium foil samples (about 10 cm squares)	1	group	supermarket	kitchen foil from the staffroom
card or cardboard samples (about 10 cm squares)	1	group	classroom	squares from a cereal box
shallow plastic tray	1	group	classroom	clean takeaway tray or deep plate
water in a jug or cup	1	group	classroom	tap water in any pourable container
dropper or teaspoon	1	group	school kit	teaspoon counted as five small drops by tipping carefully
scrap of printed paper for transparency test	1	group	classroom	a page from a recycled worksheet with large print
dry paper or paper towel for waterproof underside check	1	group	classroom	scrap of plain paper or a clean tissue
paper bag and plastic bag for the hook (or IWB photos)	1	class	classroom	two clear photos of a paper bag and a plastic bag on the IWB
cloths or paper towels for spills	4	class	classroom	old clean tea towels
Investigation Journal page	1	pupil	classroom	—

Safety watch-point

Water on floors is a slip risk — wipe spills at once. No tasting materials. Foil edges can be sharp if torn; supervise the pull test.



Teaching moves

- **Getting Started:** Hold up a clean paper bag and plastic bag (or two IWB photos). Take three or four quick ideas only. Push the key question: how could we test fairly instead of arguing? Do not name the four properties or hand out samples yet.
- **Properties we can test:** Board the words property, waterproof, strong, flexible and transparent with the table examples. Say the worked foil model aloud before groups touch anything: five drops, thirty seconds, underside on dry paper. Leave strength, flexibility and transparency for the class to discover.
- **What will we find out?:** Keep predictions light: partner talk on which material keeps water out and which lets you read a word through it. Capture two or three ideas on the board without ranking them. Cue fairness once: same size pieces, same drop count, same gentle pull for a count of three.
- **Test the materials:** Groups of three or four test one property at a time across all four materials, ticking pass/fail straight onto the Investigation Journal table. Voice the shared strength rule once: two holders, gentle pull, count to three, pass means no tear. Circulate asking what they observed, not what they hoped; slow any group that races ahead.
- **Make sense of your results:** No copying across — results are already on the journal page. Ask groups to read across their table, note one surprise, and write one evidence sentence about the best material for keeping things dry. Early finishers re-check a disputed sample rather than starting something new.
- **Recommend a material for the job:** Display Job A (rainy library-book cover) and Job B (greenhouse window panel). Give about five minutes for evidence-based choices, then take two groups per job. Model the stem: we choose ____ because our tests showed _____. If someone picks 'strongest for everything', return them to the job need.
- **What did we learn?:** Oral round only: name one property and a job it helps with, plus the biggest surprise. Check look-fors — two properties in their own words and a link from recommendation to a recorded tick. Empty trays, wipe desks and floor, dispose of sodden card.



What it should show

Typical pattern: plastic waterproof and flexible; foil waterproof but tears and blocks light; card stronger and stiffer but not waterproof; fabric flexible and often not waterproof. Job A points to plastic (or foil if strength is not critical); Job B needs clear plastic for light. Odd tears usually mean a hard pull instead of the shared gentle count-to-three rule.





Misconceptions & interventions

- **Thicker always means better for every job.** — Hold card beside clear plastic: card may win on strength but fails a window because you cannot see through it. Return them to the job need, not thickness alone.
- **The strongest material is the right choice for every job.** — Point at Job B on the board. A strong but opaque cover fails a greenhouse window — match the property the job actually needs.
- **If it looks shiny or tough it must be waterproof.** — Re-run the five-drop underside check on foil or card and show the dry or damp paper. Trust the test, not the look.

Differentiation

Emerging	Developing	Proficient
• Complete waterproof and transparent first — clearest pass/fail — and sit near the teacher table for the shared pull count. • Pre-head the journal columns with the four property words so pupils only tick pass or fail.	• After the four core tests, add the second strength check from the notes: can the sample hold two exercise books as a sling without tearing? • Prompt one 'why?' sentence for any result that disagreed with their prediction.	• Argue a trade-off: when no single material passes every need, say which property you would prioritise and why. • Use Jobs C and D from the extension set (heavy-book carrier; foldable puppet screen) and justify from the same table.

Cross-curricular hook

Link to English oral language: model the evidence stem 'we choose ____ because our tests showed ____' for justified recommendations.