materials

Waterproof or not

Lesson at a glance

Open with Irish rain and a coat: does water sit on top or go through? Pupils thumbs-guess four dry squares (fabric, paper, foil, plastic), then watch you model one drip on paper. In groups they guess-then-drip each square on a tray and notice where the water goes. On the Investigation Journal page they draw or mark keeps-water-out vs lets-water-through, then close with a coat-maker talk on why rainy coats need waterproof material.

Learning objectives

- Guess whether a material will keep water out before testing
- Drip water onto material squares and notice what happens
- Sort materials into keeps water out and lets water through

Before the bell — prep

Day before: cut hand-sized squares of fabric, paper, kitchen foil and plastic (document wallet or clean bag), plus a spare dry set per group. Set one shallow tray, dropper or teaspoon, small water cup and towel per group. Fill a jug with cold water. Print one Investigation Journal page per child. Have a raincoat or picture ready for the hook.

Lesson 12

Materials

Item	Qty	Per	Source	Low-cost substitute
shallow tray or washing-up basin	1	group	classroom	a large roasting tin or plastic storage-box lid
fabric squares (about hand-sized, e.g. cotton scrap or old tea towel)	1	group	classroom	a square cut from an old t-shirt
paper squares (plain paper or scrap paper)	1	group	classroom	newspaper squares
kitchen foil squares	1	group	supermarket	the foil lid from a clean yoghurt pot, flattened
plastic squares (cut from a clear document wallet or clean plastic bag)	1	group	classroom	a square cut from a clean food bag
dropper or teaspoon	1	group	classroom	a clean medicine syringe (no needle) or a bottle cap for pouring tiny amounts
small cup of cold water	1	group	classroom	a yoghurt pot of water
towel or cloth for spills	1	group	classroom	a few sheets of kitchen paper
spare dry material squares (same four types)	1	group	classroom	reuse any dry leftovers from the first cut
Investigation Journal page	1	pupil	provided printable	a blank sheet for drawing the two groups

Safety watch-point

Cold water only; no tasting. Roll sleeves up, wipe spills at once, dry hands before journals. Stagger handwashing so the sink does not jam; you handle very wet waste.

Teaching moves

- **Getting Started:** Keep it light and oral. Hold up a child's raincoat or a picture and ask whether rain goes through or sits on top. Take two or three ideas without correcting. Gently name that a coat-maker chooses special material so Irish rain stays outside — you will return to this at the end. Do not lay out the drip trays yet.
- **Look and wonder:** Hold up the four dry squares one by one. Say the two short meanings yourself: waterproof means water stays on top; some materials let water through and get wet. Thumbs up if they guess it keeps water out, thumbs down if they guess it goes through. Guesses are never wrong. Keep it short — no dripping yet.
- **Watch me drip:** Model the full cycle out loud with ONE paper square only: I wonder, I guess, I drip one spoon on the middle, I saw it go dark with water underneath, I think paper lets water through. Point to the underside so they know what "through" looks like. Echo the two words against what they just saw. Children watch only.
- **Drip and find out:** Send groups to pre-set stations. Sleeves up. Short turns: one child drips, others watch. Prompt 'say your guess before the drip.' One tiny drip is enough. Use a spare dry square if one soaks early. Circulate asking: Where is the water now? Is the underside dry or wet? Was your guess the same as what happened?
- **What did we notice?:** Stay at trays about two minutes, then eyes to you. Groups hold up one square that kept water out and one that let water through. Revoice gently: that one is waterproof; that one lets water through. Name one surprise out loud — often thick fabric still soaks — so the class does not invent a thick-equals-waterproof rule.
- **Show and draw:** Hands dry on the towel first; wet materials stay on the tray, never on the journal. On the board sketch a drop sitting on top and a drip going through. Children draw or scribble each square they tried into the matching group. Circling a surprise is optional. Support drawers of only two squares; scribe a word label if asked.
- **Make-sense talk:** Harvest foil and plastic as usually waterproof; paper and fabric as usually letting water through. Ask why a coat-maker would pick material like the plastic, not paper, for Irish rain. Keep foil as test evidence only — real coats use coated or plastic-like material, not ordinary tea-towel fabric or foil.

What it should show

Paper usually soaks and lets water through; many fabrics soak and feel soggy; kitchen foil and plastic usually keep water sitting on top in beads. Creased foil may pool water in a dip but still stay on top. If everything floods, the group used too much water — switch to one tiny drip. A thin bag with a hole is not a fair plastic sample; swap for a document-wallet square.

Lesson 12

Misconceptions & interventions

- **Thick things keep water out — so the fabric must be waterproof because it feels thicker than the plastic.** — Hold up the wet fabric beside the dry-top plastic. Ask where the water is now on each. Name the surprise: thickness did not decide it; whether water stayed on top did.
- **All shiny things keep water out, so anything that looks shiny will be waterproof.** — Stay with what they saw on these four squares only. Foil and plastic worked today; remind them we judge by the drip test, not by shine alone.
- **Foil would make a good rainy coat because it kept water on top in our test.** — Name foil as useful test evidence only. Point to a raincoat or wellies and say coat-makers choose special coated or plastic-like material, not kitchen foil or tea-towel fabric.

Differentiation

Emerging	Developing	Proficient
• Drip with you at the teacher table and try only two squares (e.g. paper and plastic). • Draw only one keeps-water-out and one lets-water-through mark; scribe a single word label if they ask.	• Prompt before each drip: say your guess, then watch the underside. • Ask them to tell the group one thing that matched their guess and one that surprised them.	• Try a second fabric from the scrap box already at the station and say if it was the same or different. • Early finishers draw their raincoat and whisper to a partner whether they think it is waterproof and why.

Cross-curricular hook

Link to Geography weather — Irish rain and why coats, wellies and schoolbag covers need materials that keep water out.