

Sound: travelling and muffling sound

Lesson at a glance

Open by covering a ticking kitchen timer with a tea towel so pupils hear it go quieter, not vanish. Groups pick three wraps from a tray, predict which muffles most, then sort change/measure/keep-same on the fair-test-planner interactive. At two listening stations they score each wrap on a shared 1–5 muffling scale from a fixed one-metre mark and record on the Investigation Journal page. Close with a talk on which materials won and what kept the test fair.

Learning objectives

- Plan a fair test of which materials muffle a sound source best
- Compare materials at a fixed distance and record how muffled the sound is
- Conclude that sound travels through materials and some muffle it better than others

Before the bell – prep

Set two listening stations with a kitchen timer (or moderate phone alarm), a taped 1 m mark and space to wrap. Fill group trays with tea towel/cloth, bubble wrap, newspaper, cardboard, cotton wool or foam, plus elastic bands or tape. Print one Investigation Journal page per pupil. Plan a rotation order before the bell.

Materials

Item	Qty	Per	Source	Low-cost substitute
kitchen timer or phone with alarm (moderate volume)	2	class	classroom	one shared class timer at a single station with reduced scope: half-class tests with observation partners, or each group tests only two materials, or extend the test window (see step 5 teacher notes)
assorted wrapping materials (tea towel or cloth, bubble wrap, newspaper, cardboard, cotton wool or foam packing)	1	group	classroom	scarves, jumpers, scrap cardboard and newspaper from the recycling
metre stick or tape measure	2	class	school kit	a 1 metre length of string or a taped mark on the floor at each station
elastic bands or sticky tape to hold wraps	4	group	classroom	tuck material under the timer or use a spare rubber band from stationery
Investigation Journal page	1	pupil	provided printable	ruled paper with headings material and muffling score

Safety watch-point

Never hold the sound source against anyone's ear; keep phone volume moderate; no wraps over faces; stop alarms fully between groups; clear floor tape hazards.

Teaching moves

- **Getting Started:** Start the timer bare so the class hears it clearly, then loosely cover it with a thick tea towel. Ask only: is it as loud, quieter, or almost gone? Name the shared surprise in one line — still there, just quieter — then state the aim. Do not hand out materials yet.
- **How sound travels:** Partner-whisper which wrapping will muffle best, then take two or three quick ideas. Hang Sound, Muffling and Soundproofing on the towel demo in one short line each. Head off 'the sound disappeared' — prefer 'muffled' over 'gone'.
- **Question and predict:** Show the tray and have each group choose three materials. Capture one-sentence predictions on the board without judging: 'We think the ____ will muffle most because...' Remind them an unexpected result is useful data.
- **Plan the fair test:** Hand out Investigation Journal pages first. Drive the fair-test-planner interactive: change = wrapping material; measure = how muffled; keep same = sound source, listening distance, wrap tightness. Agree the 1–5 scale once and leave it on the board. Protect about five minutes for the slim plan write-up only.
- **Test the materials:** Only stations sound — never every group at once. Circulate for same distance, same tightness, same source setting, and coach the score talk against the board scale. Waiting groups prep wraps, rehearse scoring in a whisper, or watch as observers. Aim roughly 5–6 minutes per group at a station.
- **Check your record:** Short tidy-up only: check every material has a score or rank from the station, and that the observation stays separate from any 'because it is soft' inference. Ranks alone still answer which muffled best.
- **What does the evidence show?:** Invite three or four groups to name only their top muffler and one fair-test check. Draw out that soft thick airy wraps usually beat thin hard ones, and that changing distance or tightness would spoil fairness. Treat disagreement as a fair-test clue, not a wrong answer.
- **Wrap up and tidy:** One spoken stem only: 'If we tested again, I would change... because...' Then stop all alarms, unwrap sources, return wraps to trays and clear floor tape.

What it should show

Thick soft airy wraps (tea towel, cotton wool, foam, bubble wrap) should score higher muffling than thin hard ones (single newspaper, thin cardboard). Sound still travels — it is quieter, not gone. Odd ties or surprises usually mean loose vs tight wraps, unequal bulk, or an alarm already too quiet; re-check the mark and try a clearer baseline.



Misconceptions & interventions

- **Pupils say the sound 'disappears' or is 'gone' inside a thick wrap.** — Point back to the towel demo: they could still hear it, just quieter. Prefer 'muffled' — the vibration is still there; less of it reaches the ear.
- **Groups change wrap tightness or step closer when a material seems weak, so the comparison is no longer fair.** — Stop and re-voice the keep-sames from the planner: same source, same one-metre mark, same tightness — only the material changes. Re-run that trial from the mark.
- **Pupils write why they think it happened in the score box instead of what they heard.** — At the Check your record beat, ask: 'Is that the number you heard, or the reason?' Score or rank first; save soft/thick talk for the evidence discussion.

Differentiation

Emerging	Developing	Proficient
• Offer a shortlist of two soft materials plus one thin one, and coach the score conversation against the board scale at the station. • Accept ranks 1st–3rd instead of the 1–5 scale if numbers slow the group down.	• If a group finishes early and the station is free, run a second trial of the same three materials and compare scores.	• Add a fourth tray material if time allows, or briefly discuss loose vs tight wrap as talk only — still changing one thing. • Critique another group's fair-test check: distance mark, wrap bulk, or source setting.

Cross-curricular hook

Link to Maths Measures — fixed 1 m listening distance and ordered 1–5 muffling scores or ranks.