

Sound: travelling and muffling sound

Lesson at a glance

Open by covering a ticking kitchen timer with a tea towel so the class hears it go quieter. Groups pick three wrapping materials from a tray, predict which muffles most, then sort change/measure/keep-same cards on the fair-test planner and write a slim plan on the Investigation Journal page. At two listening stations they score a bare baseline plus each wrap on a shared 1–5 muffling scale at a fixed 1 m mark. Close with a display-only talk on soft thick materials versus thin hard ones 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

Day before: gather two kitchen timers (or phones on a moderate ring), trays of tea towel/cloth, bubble wrap, newspaper, cardboard, cotton wool or foam, plus elastic bands or tape. Mark two 1 m listening stations with tape or a metre stick, stations as far apart as the room allows. Print one Investigation Journal page per pupil.

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. Clear floor-tape trip hazards and stop every alarm fully between groups.

Teaching moves

- **Getting Started:** Start the timer bare on the desk, then loosely cover it with a thick tea towel. Ask only: is it as loud, quieter, or almost gone? Name the surprise in one line (still there, just quieter), then stop. Do not hand out wraps or name variables yet.
- **How sound travels:** Run a quick partner whisper, take two or three ideas, then hang Sound, Muffling and Soundproofing on what pupils just said and the towel demo: one short line each. Head off “the sound disappeared” by saying the vibration is still there; less of it reaches the ear.
- **Question and predict:** Show the tray and let each group choose three materials. Capture one-sentence predictions on the board (We think the ____ will muffle most because...) without judging. Remind them an unexpected result is useful data.
- **Plan the fair test:** Hand out Investigation Journal pages first. Drive the fair-test planner: Change = wrapping material; Measure = how muffled; Keep the same = sound source, listening distance, tightness. Agree the 1–5 muffling scale once and leave it on the board. Then give five quiet minutes for each pupil to write only their three materials, one-sentence prediction, and scale or rank: no full rewrite of the card sort.
- **Test the materials:** Run two stations only so competing alarms do not drown the measure. Baseline listen first, then each material once; one agreed score written immediately. Circulate for same distance, same tightness, same source setting. Waiting groups check the plan, rehearse the score talk, or observe another group. Do not start a second experiment.
- **Check your record:** Short tidy-up only. Check every material has a score or rank from the station, and that the score is what they heard, not why. Ranks 1st–3rd still count; do not invent extra journal columns.
- **What does the evidence show?:** Invite three or four groups to report only their top muffler and one fair-test check. Draw out: sound still travelled; soft thick airy wraps often beat thin hard ones; changing distance or tightness would make it unfair. If groups disagree, ask whether wraps were equally tight or bulky.
- **Wrap up and tidy:** One spoken stem only: If we tested again, I would change... because... Stop all alarms, unwrap sources, return wraps to trays, clear floor tape.

What it should show

Expect thick soft airy materials (tea towel, cotton wool, foam, bubble wrap) to score higher for muffling than thin hard ones (single newspaper, thin cardboard). A tea towel that scores oddly low is usually wrapped loosely with air gaps: re-wrap both materials the same tightness and re-listen if the station is free. If all scores look the same, the alarm may be too quiet or listeners off the mark.



Misconceptions & interventions

- **Pupils say the sound “disappears” or is “gone” inside a thick wrap.** Point back to the towel demo: you still heard it, just quieter. Prefer “muffled”: the vibration is still there; the material absorbs or scatters some of it so less reaches the ear.
- **Pupils change how tightly they wrap or step closer when a material seems quiet, thinking that is still a fair material test.** Stop and re-voice the three keep-sames on the board: same source, same 1 m mark, same tightness. Only the material changes; ask them to re-wrap and stand on the mark.
- **Pupils treat a loose tea towel that scored low as proof soft materials do not muffle.** Treat it as a finding about wrapping, not a wrong answer. Ask them to wrap the tea towel and a thin material equally snugly and listen again if free.



Differentiation

Emerging	Developing	Proficient
• Pre-shortlist two soft materials and one thin one so the group chooses from three clear options; coach the score talk at the station against the board scale. • Accept ranks 1st–3rd instead of the 1–5 scale if scoring feels heavy.	• After one agreed score per material, prompt: why do you think that wrap scored higher: thickness, softness, or air gaps? • If the station is free, run a second trial of their top material only.	• Test one extra material from the tray, still changing only the material. • Fair-test critique in talk only: compare a loose wrap with a tight wrap of the same material and say which keep-same they broke.



Cross-curricular hook

Tie to Maths Data: pupils order muffling scores or ranks and read which material was the mode across groups.