

Sound insulation: making it quieter

Lesson at a glance

Hook with a short bare-buzzer beep and everyday quieter spaces (shut doors, soft cushions). Pupils name four wraps—foam, soft cloth, bubble wrap, stiff card—predict which will muffle best on the Investigation Journal page, then rate one shared front-of-class kit from a taped listening line. Class scores go into the IWB bar chart; they order quietest to loudest by ear and meet the label sound insulation in the close.

Learning objectives

- Predict and test which wrapping materials muffle a sound best
- Order materials from quietest to loudest using listening evidence

Before the bell – prep

Print the Investigation Journal page. Set one shared front kit: buzzer or timer, box with lid, and samples of foam, soft cloth, bubble wrap and stiff card. Tape one listening line on the floor. Ready Quiet/Medium/Loud cards or board icons and the IWB chart interactive.

Materials

Item	Qty	Per	Source	Low-cost substitute
small battery buzzer or loud ticking kitchen timer	1	class	school kit	one phone timer held by the teacher at class-friendly volume while volunteers take turns to wrap
cardboard box with lid (shoe-box size)	1	class	brought from home	large plastic storage tub with a lid
wrapping samples (foam scrap, soft cloth, bubble wrap, stiff card)	1	class	classroom	sock or tea towel, newspaper scrunch, and a cereal-box panel instead of foam, cloth, bubble wrap and card
masking tape listening line on the floor	1	class	classroom	a chair or book as a fixed listening marker
Quiet / Medium / Loud cards or board icons	1	class	classroom	three sticky notes labelled quiet, medium and loud
Investigation Journal page	1	pupil	provided printable	plain paper with headings I predict / what I heard / quietest to loudest



Safety watch-point

No buzzer against ears; short beeps only at a class-friendly level. Stop if anyone covers their ears uncomfortably. Hand wash if foam dust bothers skin.



Teaching moves

- **Getting Started:** Give one short bare beep or tick so the class hears the sound they will work with, then stop it. Ask only where school already feels quieter—doors, cushions, coats—without handing out wraps yet.
- **Soft things can quieten sound:** Hold up the four real samples while you introduce muffle and soft versus hard feel. Do not claim soft always wins on the board; keep sound insulation as your teacher label until the close. Model the stiff-card cycle: predict, box and lid, listen, observe still loud.
- **What do we think will muffle best?:** Show the four samples again. Pupils whisper a partner prediction, then write material plus a short because on the Investigation Journal before any test. Capture one or two reasons on the board without ranking; offer blank stems only.
- **Wrap and listen:** Run one shared kit at the front so only one beep plays at a time. Volunteer pairs wrap; everyone else stays on the taped line. Keep the method fixed: same buzzer volume, same box and lid, full unwrap between tries. Order: stiff card (model) then foam, soft cloth, bubble wrap—aim to finish all four listens inside about 11 minutes.
- **Record our findings:** Drive the IWB yourself: class calls 1 quiet, 2 medium or 3 loud for each wrap while you type. Hand-vote on disagreements. Show the bar chart, name shortest and tallest bars, then pupils jot the four heard codes plus quietest/loudest on the journal—keep this inside the lesson, not homework.
- **Quietest to loudest:** Lay the real samples in a line or move names on the board. Insist justifications use listening numbers ("cloth was a 1, card was a 3"), not how soft a wrap felt in the hand. Only now notice whether soft wraps muffled more than hard card.
- **What did we learn?:** Revoice one pupil link from soft wrap to quieter sound, then offer sound insulation once. Honour odd listening data if bubble wrap surprised the class. Switch buzzers off, return wraps, brief hand wash if foam dust is an issue.



What it should show

Expect foam and thick soft cloth near 1 (quietest) and stiff card near 3 (loudest); bubble wrap often lands middle. If every wrap sounds the same, listeners are too far or the beep is too weak—step closer or use a slightly stronger class-friendly beep. Odd loud soft-wrap scores usually mean the lid was not shut or the wrap was incomplete.



Misconceptions & interventions

- **Only stopping the buzzer counts as quieter—wrapping does not really change the sound.** — Keep the same short beep each try and rate from the line so they hear volume change with the wrap still buzzing inside.
- **Thicker or softer always means quieter, so we can rank without listening.** — Stress judge-by-ear: record 1–2–3 from the same spot, then order only from those scores, not from how the wrap looks or feels.
- **If my hand feels the wrap is soft, it must have muffled best.** — Point back to the chart numbers: cloth was a 1 and card a 3 because of what we heard, not because soft felt nicer.

Differentiation

Emerging	Developing	Proficient
• After each beep, let pupils point to Quiet / Medium / Loud cards or the three board icons instead of choosing a number first. • Offer the stem "I think ____ will be quietest because ____" and accept a single material name on the journal.	• Ask why two scores might differ if the lid was loose or someone stepped off the listening line. • Have them name one everyday muffling example (shut PE door, library cushions) after the order is set.	• Challenge them to critique fairness: what had to stay the same each try, and did we keep it? • Prompt only as talk for another day: would two layers of cloth change the order, and how could we find out?

Cross-curricular hook

Link to Maths data: class 1–3 scores become a bar chart; shortest bar is the best muffler.