

Find a problem worth solving

Lesson at a glance

Open with the muddy-doorway story: a clever fix for the wrong problem wastes time. Introduce empathy and user, then lead the class on a short watch-and-ask walk (outdoor route or indoor classmate-role stations) with clipboard notes. Back at desks, groups turn notes into the Investigation Journal page—user, need, labelled sketch, success checks—then share briefs against the board check: can you say who it is for and what they need?

Learning objectives

- Use empathy to spot a real small problem for a chosen user in school
- Name the user need and what success would look like
- Sketch a first idea that could solve the problem

Before the bell – prep

Form groups of 3–4 beforehand. Set one full path: outdoor watch points with willing users (SNA, caretaker, secretary) or indoor stations (pegs, bookshelf, door, shelf) with role swaps. Print Investigation Journal pages; clipboards and pencils stay for the walk only. Prep indoor stations anyway so rain does not scramble the lesson.

Materials

Item	Qty	Per	Source	Low-cost substitute
clipboard	1	pupil	classroom	a hardback book or stiff folder to lean on
pencil	1	pupil	classroom	any writing tool the pupil already has
Investigation Journal page	1	pupil	provided printable	plain paper with teacher-prompted headings said aloud (problem, user, need, success, sketch)
ruler	1	pupil	classroom	estimate sizes by finger widths if rulers are short

Safety watch-point

Stay with the class outdoors; walk, do not run; keep pathways clear for others; agree boundaries before leaving; return promptly. Heavy rain means the indoor route.

**Teaching moves**

- **Getting Started:** Tell the muddy-doorway story in about three minutes. Ask why building before understanding the problem wastes time; take three or four answers and link gently to engineers starting with people. Keep clipboards on your desk so pupils listen instead of writing.
- **Start with the person, not the stuff:** Write only empathy and user on the board. Think aloud the modelled cycle (wonder, watch, ask, notice need) so the class hears a person working it out. Head off invention-first jumps: person first, need second, idea third. Leave user need and success criteria until step 4.
- **Walk, watch and ask:** Lead the whole class; announce each watch point. Model one polite question: What makes this bit awkward for you? Look for watch-before-talk, a named user (not everyone), and notes about awkwardness not inventions. If an outdoor job is missing, switch to prepared indoor stations.
- **Name the need and sketch a first idea:** Board the four stems before they sit: Our user is... The awkward part is... They need... Success looks like... Hold the order—user and need first, then labelled sketch, then one or two success checks. At about eight minutes, call: if user and need are not down, finish those before the sketch. Ask of wild machines: which part meets the need you wrote?
- **Share your user and need:** Pairs whisper user, need and success check while you walk and coach vague briefs. After each of three or four shares, ask the board check: Can you say who it is for and what they need? Only then open why naming the problem first saves time. Collect Journal pages for the later prototype build.

What it should show

Successful groups leave with a named real user (not everyone), a plain-words need from watching or asking, one testable success check, and a simple labelled sketch tied to that need. A surprising or weak brief usually skipped watching—user is vague, or the sketch is a cool machine with no link to the written need; send them back to the stems before the share.

Misconceptions & interventions

- **Pupils jump straight to a cool invention—a robot door!—before naming who it is for or what they need.** — Pull them back with person first, need second, idea third. Point at the board stems and insist the sketch waits until user and need are written.
- **The user is everyone or the whole school, so the brief cannot be tested.** — Ask who you actually watched or spoke to. Have them replace everyone with that one person or role before they sketch.
- **The sketch is a wild machine with no link to the need they wrote.** — Ask: Which part of your sketch meets the need you wrote? If they cannot point to one, trim the drawing to the part that does.

Differentiation

Emerging	Developing	Proficient
• Give a short menu of watch places (cloakroom pegs, bookshelf, door mat) and keep the four sentence starters visible; accept drawings with stems spoken aloud if writing is a barrier.	• After watching, refine one polite question of their own; aim for user, need, labelled sketch and one clear success check.	• Add one risk or limit to the brief (must be safe in a busy corridor; must use everyday materials) and be ready to say where watching changed their first guess.

Cross-curricular hook

Links to English oral language—polite questions, plain-words needs—and SPHE noticing how school spaces work for different people.