

engineering

Plan and draft the helper

Lesson at a glance

Open with an awkward classroom job (big book held open, brushes rolling) and the idea that guessing is not enough. Pairs ask and watch a real user, then capture user, job and one noticed difficulty on the Investigation Journal Design Brief page. Teacher models two rough helper sketches, a choose-and-label plan, and a materials list from the sample tray. Pairs draft two ideas, choose one, label parts and list materials, then swap plans with another pair for kind I-like / I-wonder comments.

Learning objectives

- Use empathy to confirm a real user's problem by asking and watching, not guessing
- Draft two or more helper ideas, choose one, and label a plan with the materials to use

Before the bell – prep

Before the bell: decide the default pair-user setup (or a visiting adult / you as shared user). Print one Design Brief page per pupil. Put a large reading book by the board for the live model. Set one sample tray of card, masking tape, lolly sticks and fabric per group table — handle only, no building.

**Materials**

Item	Qty	Per	Source	Low-cost substitute
Investigation Journal Design Brief page	1	pupil	provided printable	a blank A4 page with headings User, Problem, Drafts, Chosen plan, Materials
large reading book (demo prop for live model)	1	class	classroom	a large workbook, atlas, or ring binder that is awkward to hold open with one hand
clipboard	1	group	classroom	a hardback book or firm cardboard sheet to lean on
design paper for extra ideas	2	pupil	classroom	the back of used worksheets
coloured pencils	1	group	classroom	ordinary pencils only
sample build materials tray (card offcuts, paper strips, masking tape, lolly sticks, string, cardboard tubes, fabric scraps, bottle tops)	1	group	classroom	card from cereal boxes, used envelopes, elastic bands and spare pencils as stand-ins

Safety watch-point

Keep ask-and-watch kind and short — no filming and no laughing at the user. Helpers planned must stay safe for classroom use; no sharp or heavy designs.



Teaching moves

- **Ask and watch first:** Project only the two short board lines. Invite a volunteer with the large reading book; think aloud one question, watch a few seconds, then name what you noticed. Sketch two rough helpers (folded card prop, lolly-stick V), voice one good and one tricky point each, choose one, add two labels and one material. Finish choose-and-label even if time is tight so pairs see the full sequence.
- **Ask and watch:** Run pairs at tables: one user shows an awkward job, the other asks and watches. Coach stems: What job feels awkward? Can you show me? What would make that easier? Fill the Investigation Journal user section straight after watching. Keep watching kind and short — no filming, no laughing. Two quick whole-class shares only; send pairs who invent a problem back to ask again.
- **Draft, choose and label the plan:** Draw the sample plan yourself in under two minutes (two rough boxes, then clearer L-stand with base / back rest and materials). Reveal one instruction at a time: check user box, two quick ideas, partner whisper of good/tricky, clearer chosen drawing, two labels plus tray materials. Steer toward simple holding or moving jobs makeable next session. No building today.
- **Share our plans:** Pair pairs with a visible two-minute timer each way. Require: name the user, the awkward job, and the materials chosen; one kind I-like or I-wonder comment. If a pair still cannot name user or job, send them back to the Journal user box rather than polishing the drawing. Store pages for the making lesson.

What it should show

Every pair leaves with a named user, one awkward job, two quick idea sketches, and one clearer chosen plan with at least two part labels and a short materials list from the tray. Successful plans are simple classroom helpers (book stand, brush pot, door wedge) tied to what the user actually showed. A pair with a clever gadget but no user name guessed instead of asking — send them back to the user box.

Misconceptions & interventions

- **Pupils invent a clever gadget without checking the user — I already know what they need.** — Ask what did your user say or show? If they cannot answer, send them back to watch and fill the Journal user box before any more drawing.
- **Pairs draw only one idea because the board showed only one.** — Point back to the two rough boxes on the sample plan and say makers draw more than one idea before they choose — insist on two quick sketches before the clearer drawing.
- **Pupils race to build or list materials they do not have.** — Remind them: handle the tray only, no building today; materials must come from card, tape, lolly sticks and fabric so the helper is makeable next time.

**Differentiation**

Emerging	Developing	Proficient
• Trace a simple L-shape or folded-card stand on the Journal page and add two labels from the sample plan words. • Stay at the teacher table to rehearse the ask stems before watching their user.	• After choosing, whisper one good point and one tricky point for the chosen idea, then add them as a short note beside the clearer drawing.	• Add a second view of the chosen helper or note one part that might move; list one backup material from the tray — no building.

Cross-curricular hook

Oral language: practise kind I-like / I-wonder feedback stems when pairs share plans.

