

Build the prototype

Lesson at a glance

Open with a short turn-and-tell: who is the user and what one job must the prototype do. Groups re-read their Investigation Journal design page (Design Brief), appoint a materials collector and brief-keeper, then build a first junk-model prototype from card, tubes, bottles, tape and string. Mid-build they pause to check the model against the brief and sticky-note any build changes. Close by recording a sketch plus short notes on the Investigation Journal page, then a quiet gallery walk and three spoken samples.

Learning objectives

- Build a working prototype from the plan sketched earlier in this project
- Note build changes against the original Design Brief
- Work safely with junk-modelling materials and scissors under adult supervision

Before the bell – prep

Day before: pack one kit bag/tray per group (card, tubes, bottles, masking tape, string, elastic bands, sticky notes, two round-tip scissors). Pre-score thick card and pre-cut string lengths. Set a side-table cut-station tray. Have each group's earlier Design Brief ready; print Investigation Journal pages but hold them until the record step.

**Materials**

Item	Qty	Per	Source	Low-cost substitute
group Design Brief (Investigation Journal design page) from earlier in this project	1	group	classroom	a fresh sketch on plain paper if a brief was lost, rebuilt from the group's memory of the user and problem
prepared junk-modelling kit bag or tray	1	group	classroom	loose materials in a shared box if bags are not available, still issued only when collectors are sent
cardboard boxes, tubes and scrap card	1	group	classroom	cereal boxes and kitchen-roll tubes brought from home
newspaper sheets	6	group	classroom	scrap plain paper or old worksheets
masking tape	1	group	classroom	sticky tape or string for lashing joints
string	1	group	classroom	wool or strips of fabric
elastic bands	6	group	classroom	extra string ties
clean plastic bottles or cups	2	group	supermarket	yoghurt pots or cardboard cups
round-tip scissors for simple table cuts	2	group	classroom	one shared scissors tray per two groups with the same adult cut-station burst routine
sticky notes	6	group	classroom	small scrap paper slips and a pencil
Investigation Journal page	1	pupil	provided printable	plain paper labelled with the pupil's name and group

Safety watch-point

Round-tip scissors only at tables; adult does difficult cuts at the cut station in short bursts. Watch eyes when structures collapse; no running with materials; hand wash after tidy.

Teaching moves

- **Getting Started:** Keep kits off tables. Launch straight into a 30-second turn-and-tell, then invite one or two groups to name their user and the one job. Hold up a Design Brief (with permission) or point to the wonder wall and say once that today's job is a first working model, not a finished product. Scissors stay stored until the build.
- **Read your Design Brief again:** Hand back each group's Design Brief. Groups re-read problem, user and success, then decide what to build first. Before any kit moves, every group names a materials collector and a brief-keeper who keeps the page flat and visible. Only then does the collector fetch one prepared kit from the side table.
- **Build the prototype:** Circulate with the prompts: Which part of the brief are you building now? Does this still help your user? The moment a group alters the sketch, get a sticky-note jot so step 5 is not from memory. Table scissors for simple cuts only; tricky pieces go in the cut-station tray while pupils keep taping. Clear that tray in one-minute bursts between tables. Freeze groups go back to the success line and build only the part that would prove it.
- **Check against the Design Brief:** Pause all hands. Model one spoken check: match to user and problem, name one build change, name what still needs adding. Visit each group once. If a model has drifted into something fun but unrelated, ask whether the user would still recognise it as a fix. Nearly-finished groups strengthen weak joints, not decorations.
- **Record your build notes:** Hand out Investigation Journal pages only now. Show the tiny board example once: quick sketch plus two short lines. Pupils record what the prototype does for the user, one or two build changes and why, and what still needs finishing before the test. Pages stay with the classroom-stored prototype — they do not go home.
- **Share how far we got:** Gallery walk 90 seconds only — two tables, look not talk, then a clear stop. Sample three groups on the stems: Our user is... Our prototype tries to... One thing we changed... Finish with the class question: Can you still hear the user's need in that design? No full load test today.
- **Tidy and look ahead:** Allow real tidy time: bag or label every prototype with its Design Brief and journal page, sweep tape scraps, return scissors, hand wash, clear walkways. Optional spoken homework only: ask an adult whether a first model they once made ever changed before the finished version.

What it should show

A successful prototype stands or holds itself the way the brief describes (or hangs/clips/sits as planned) and still addresses the named user and job. Expect several honest build changes from sketch to model — that is normal. A group with a neat but off-brief model has drifted; steer them back to the success line rather than praising finish quality.



Misconceptions & interventions

- **We have to copy the sketch exactly or the prototype is wrong.** — Point at their Design Brief success line and say the job is to solve the user's problem, not photocopy the drawing. Get them to sticky-note the change and why, then keep building.
- **The prototype is the finished product, so it should look neat and complete today.** — Re-voice once: engineers build a first model to learn quickly. Praise a clear link back to the user over a polished finish, and leave testing and improve for next time.
- **If it is fun or decorative it still counts, even if it no longer helps the user.** — At the mid-build check ask: Would your user still recognise this as a fix for their problem? Send them back to the one part that would prove the success line.



Differentiation

Emerging	Developing	Proficient
• Build only the one part of the idea that would prove the success line on the Design Brief; teacher table supports joining with tape. • Use sticky notes with a starter phrase (Changed ____ because ____) so the journal record is a transfer, not a rewrite from memory.	• After the first part works on its own, strengthen weak joints and note one build change with a clear reason before the mid-build check.	• Add a second feature only after the first part works alone, then critique whether the prototype would give a fair test next time with the materials used.

Cross-curricular hook

Links to Visual Arts construction: joining, stability and choosing materials for a real classroom user.