

Make something that moves

Lesson at a glance

Open by spotting classroom movers (door, bin lid, toy car wheels) and naming the part that moves and its job. Tables are pre-assigned one build: a split-pin lever that lifts, a four-wheel card cart that rolls, or a pull-tab that slides. After a quick join demo, groups build from tray kit, try the part three times, change one thing to smooth it, then draw the model and mark the moving part on the Investigation Journal page before a short share and safety tidy.

Learning objectives

- Make a simple model with one moving part that does a job
- Improve how smoothly the moving part works

Before the bell – prep

Night before: build one sample of each option and pre-assign tables Lift, Roll or Slide. Pre-cut A5 card, paper strips and centre-holed card wheels; pre-punch pin holes and half-start a few lever bases. Tray per group: card, tape, split pins, blunt skewers/dowels, round-tip scissors. Adult keeps the hole punch.

**Materials**

Item	Qty	Per	Source	Low-cost substitute
card pieces (cereal-box card or classroom card, pre-cut rectangles about A5 plus spare)	6	group	classroom	flattened cereal boxes cut into sheets
paper strips (for pull-tabs and lever arms)	8	group	classroom	strips torn or cut from scrap paper
split pins (paper fasteners)	6	group	school kit	a loop of soft wire or a brass paper fastener from a stationery shop
masking tape or sticky tape	1	group	classroom	washi tape or short lengths of any sticky tape pre-torn on the tray edge
blunt wooden skewers or thin dowels (for cart axles: two per cart, plus spares)	4	group	supermarket	straight drinking straws with a pencil pushed through, or rolled tight paper tubes
wheels (thick card circles with centre holes pre-punched; four per cart)	4	group	classroom	clean bottle tops with adult-made centre holes, only if already collected
round-tip scissors	2	group	classroom	teacher pre-cuts shapes so pupils only tape and assemble
small light loads (rubbers or large paper clips) for lever tests	3	group	classroom	a folded scrap of card or a counters piece
hole punch (adult use, top-ups only)	1	class	classroom	adult makes pin holes with the tip of closed scissors on a board
half-started lever bases (base card with split pin already in)	2	group	classroom	one shared half-started base that groups may look at then copy
ready sample models (one lever, one four-wheel cart, one pull-tab) for join demos	1	class	classroom	clear labelled board sketches only if samples cannot be made; still point to each join before release





Safety watch-point

Adult supervision for scissors and pointed skewers; store sharp ends down on trays; no running with materials. Collect skewers and scissors first at tidy.

Teaching moves

- **Getting Started:** Hold up one everyday mover (toy car, scissors or a cupboard hinge). Ask which part moves and what that movement is for. Keep materials on trays; do not hand out builds yet.
- **What is a moving part?:** Project the short board text and the three lift/roll/slide sketches. Anchor job with the object from Getting Started so pupils point before they build. Name the mechanism only for each table's assigned option — not all three as whole-class vocabulary.
- **Make your moving model:** Model each join once (about 3 minutes total): lever think-aloud with pin and rubber; hold up ready cart and pull-tab samples and point to axles/wheels or strip and guides. Release tables to their assigned option only. Circulate for pins and sticks; adults make leftover holes. Stop groups adding motors or extra levers — one moving part is enough.
- **Try it and make it smoother:** Have groups try three times, then change one thing only (pin tightness, stiffer strip, straighter axles, freer wheels, wider tape guides). Ask: What was sticky or wobbly? What one change did you try? Is it smoother now? Do not use fair-test language.
- **Draw your model:** Keep the three stems on the IWB. Every pupil draws the model and marks the moving part. Writing is a goal not a gate — slow writers may point-and-say stems while you jot a note. Check by asking them to point to the moving part on the drawing.
- **Share and tidy:** Hard stop: share first (one or two groups name the moving part, its job and the one fix), then full safety collect — skewers and scissors first, bag split pins, recycle scrap. Optional home noticing: find one moving part and tell an adult what it does.

What it should show

A successful model has one clear moving part on a steady frame that does its job: lever lifts a light load, cart rolls straight on four wheels, pull-tab slides the picture out. After one change it should stick or wobble less. Odd results usually mean a floppy strip, pin too tight, axles askew, or several changes at once — re-try with one fix only.

Misconceptions & interventions

- **Pupils think the whole model has to move, so they shake or carry it instead of working one part.** — Point back to the sample: frame stays still, only the lever, wheels or tab moves. Have them hold the base still and work just the moving part.
- **Pupils treat a wobbly join as 'more moving' and leave pins or tape loose.** — Show that smooth movement needs a firm join that still turns or slides. Tighten or restick, then compare the smoother try.
- **Pupils change three things at once and cannot say what helped.** — Stop the hands and revoice: change one thing only, try again, then tell the group what changed.

**Differentiation**

Emerging	Developing	Proficient
• Offer a half-started lever base with the pin already in, or a tray with pre-cut wheels and strips so the pupil joins and tests rather than cutting.	• If finished early, test whether the part moves the same way every time before the improve step; name the one change aloud.	• Add a simple label or a second light load on the lever still with only one moving part, or explain to another group why their one change made it smoother.

Cross-curricular hook

Link to Maths measures: compare how far the cart rolls before and after lining up the wheels.