

engineering

Make something that moves

Lesson at a glance

Open by spotting classroom moving parts—a door swing, bin lid lift, toy-car wheels—then name that one part moves while the frame stays still. Each table builds only its pre-assigned option: a split-pin lever that lifts a rubber, a four-wheel card cart that rolls, or a pull-tab that slides a picture. Groups try the part three times, change one join to smooth it, then draw the model and mark the moving part on the Investigation Journal page before a short share and careful 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 each of lever, four-wheel cart and pull-tab. Pre-cut A5 card, strips, punched wheel circles and a few half-started lever bases; pre-assign Lift/Roll/Slide trays. Keep hole punch adult-only. Skip Roll tables if wheels and axles are not ready.

**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 on round-tip scissors and blunt skewers; store sharp ends pointing down on trays; collect skewers, scissors and split pins before anyone stands to leave; no running with materials.

Teaching moves

- **Getting Started:** Hold up one everyday object (toy car, scissors, cupboard hinge). Ask which part moves and what that movement is for. Do not hand out build kits yet—keep eyes on the object.
- **What is a moving part?:** Project only the short board text and the three lift/roll/slide sketches. Anchor job with the object from Getting Started so pupils can point. Name the mechanism only for the option each table will build—do not teach all three as whole-class vocabulary.
- **Make your moving model:** Model each join once (about 3 minutes total): stiff strip on a split pin lifting a rubber; two axles and four wheels on a card body; picture on a pull-strip in tape guides. Send tables to their pre-assigned option only. Circulate for pins and sticks; adults finish leftover holes. Stop anyone adding motors or extra levers—one moving part is enough.
- **Try it and make it smoother:** Keep language simple: try three times, notice stick or wobble, change one thing, try again. Watch levers for tight pins or floppy strips, carts for skewed axles, pull-tabs for narrow twisted paths. If a group changes three things at once, steer them back to one fix.
- **Draw your model:** Keep the three stems on the IWB. Every pupil draws and marks the moving part; slow writers may point-and-say stems while you jot a note. Circulate and ask them to point on the drawing so decoration alone does not pass.
- **Share and tidy:** One or two groups only: name the moving part, its job, and the one improve change. Then stop shares and spend a full 3 minutes collecting—skewers and scissors first, bag split pins, recycle scrap. Tidy is non-negotiable before the bell.

What it should show

A successful model has one clear moving part on a steady frame that does a visible job: the lever lifts a light load, the four-wheel cart rolls straight when pushed, or the pull-tab slides the picture out. After one change, movement should stick or wobble less. A model that wobbles all over usually has a loose frame—ask them to hold the base still and move only the one part.

Misconceptions & interventions

- **Pupils think the whole model has to move, or that a wobbly join means 'more moving'.** — Ask them to hold the frame still with one hand and move only the intended part. Stress that smooth movement needs a firm join that still lets the part turn, lift or slide.
- **Pupils change three things at once when improving and cannot say what helped.** — Stop the hands and revoice: 'Change one thing only—tighter tape, a stiffer strip, or straighter wheels—then try again.' Ask what was sticky before and after that single fix.

**Differentiation**

Emerging	Developing	Proficient
• Offer a half-started lever base with the split pin already in, or pre-cut sliding pieces on the pull-tab tray, so the pupil joins and tests rather than cutting.	• If finished early, ask them to test whether the part moves the same way every time and name one sticky spot before the improve step.	• Add a simple label or a second light load on the lever still with only one moving part, or explain aloud why the one change made the movement smoother.

Cross-curricular hook

English oral language: pupils rehearse the three stems aloud—naming the part, its job, and the one fix—before or instead of writing.

