Lesson 33

engineering

Stronger and steadier builds

Lesson at a glance

Open with a small ready tower or cup-and-card bridge and ask what makes a build fall or stay up. Name free-standing once hands come off the demo. Pairs or small groups build a tower or bridge from blocks, cups and card, test hands-off, then gently rest a light soft toy or sponge on top. Freeze that before, change one thing to steady it, and re-test. Close with table-side show-and-tell naming the one change and linking to builders and engineers.

Learning objectives

- Build a free-standing tower or bridge that stands on its own
- Test whether it holds a light object
- Change one thing to make the build steadier

Before the bell — prep

Night before or morning: one tray per pair/group with 12–20 blocks or 8–12 stacking cups, a few stiff card sheets, a short strip of masking tape, and one light object (soft toy, sponge or counters). Pre-build one small demo tower or cup-and-card bridge. Clear tables; keep builds below shoulder height.

Materials

Item	Qty	Per	Source	Low-cost substitute
small tray of wooden blocks or stacking cups (about 12–20 blocks or 8–12 cups)	1	group	classroom	empty clean yoghurt pots or small cardboard boxes of similar size (roughly 8–12 pieces)
stiff card sheets (A4 or cereal-box card pieces)	3	group	classroom	flattened cereal-box panels cut into flat pieces before the lesson
masking tape (short roll or pre-torn strips)	1	group	classroom	ordinary sticky tape or washi tape
light test object (small soft toy, sponge or a few counters)	1	group	classroom	a clean sock rolled into a ball, or a rubber

Safety watch-point

Builds stay below shoulder height. Stand back if a stack topples; mind fingers between blocks and cups. No pushing other groups' builds over.

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Teaching moves

- **Getting Started:** Keep it oral and light. Hold up the ready demo tower or cup-and-card bridge — do not open the full trays yet. Ask what makes a build fall and what might help it stay up; take two or three ideas only. Point to the classroom easel, coat stand or a local footbridge as a real wide-base example.
- **Talk and share ideas:** On the carpet, take hands off the demo so everyone sees it stand alone, then say free-standing. Gather tower-or-bridge choices and ideas (wide base, careful stacking, card deck, a little tape) without lecturing. Head off "taller is better" — the win is free-standing and steady.
- **Build your tower or bridge:** Live-model one minute: skinny four-cup stack, hands off (leans), soft toy on (tips), notice the narrow base — then stop. Signal move to trays. First call: build, hands off, does it stand? Second call once most are free-standing: gently rest the light object. Praise free-standing, not height. Freeze first successful tries; no improving yet.
- **Test and make it steadier:** Whole-class freeze: this is your before — do not touch yet. Each group names one change aloud first (wider base, extra card, tape a join, wider cup footprint, toy nearer the middle). Only then may they touch. Re-test hands-off with the light object: What one thing did you change? Is it steadier now?
- **Show and tell:** Builds stay on tables; children stand behind them. Two or three groups give one short sentence on their change and whether the toy stayed. After each, ask the class what changed and why it might help. Revoice free-standing and land builders/engineers with the easel, coat stand or local footbridge.

What it should show

Most groups reach a hands-off free-standing tower or bridge and can rest the light object without an instant tip. After one change, expect a wider base, taped join or centred load to feel steadier. A build that only stands while held is not yet free-standing — prompt hands off before any improve. Early finishers may try the other build type, not race taller.

Misconceptions & interventions

- **Taller always means better — pupils race height instead of a steady free-standing build.** — Praise hands-off standing and the toy test, not height. Point at the demo: free-standing and steady is the win, even if it is short.
- **Pupils change several things at once, so they cannot tell what helped.** — Freeze the before and make each group name one change out loud before any hands move. After the re-test ask only: What one thing did you change?
- **They think the build only counts if someone holds it or keeps a hand nearby.** — Model hands fully off the demo and revoice free-standing. Have them take hands away on their own build before the light-object test.

Differentiation

Emerging	Developing	Proficient
• Offer a partly started wide base or two cups already placed as feet; stay at the teacher table for the hands-off and toy-test signals. • Accept free-standing alone as success if the light-object test is still a stretch; they can name a planned change at show-and-tell.	• Prompt one clear improve from the stuck list (wider base, tape a join, centre the toy) and re-test with the same light object.	• After one successful improve, try the other build type (tower if they made a bridge) and say which felt steadier and why. • At show-and-tell, explain why their one change helped using words like wider, strong or steady while pointing at the build.

Cross-curricular hook

Link to Aistear/play construction and oral language — pupils describe one change in a full sentence at their table.