engineering

Present the design analysis

Lesson at a glance

Open by framing pupils as engineers who must tell the story of their bird feeder, not only show the finished object. Unpack the five-part design analysis on the board, then groups prepare a one-minute talk using their prototype, Design Brief and test notes as evidence. Presentations run whole-class or paired by group count, with listener questions on choices and evidence. Close on the Investigation Journal page and a display-only talk on what the tests surprised them about.

Learning objectives

- Present the user need, design choices and test evidence for the feeder
- Analyse the iterative design process: what changed and why
- Propose a clear next step if the design were developed further

Before the bell — prep

Before the bell, lay each group's feeder prototype and its Investigation Journal pages (Design Brief and test notes from earlier in this project) on the tables. Set out presentation paper and pencils for brief cue notes only — not posters.

Materials

Item	Qty	Per	Source	Low-cost substitute
bird feeder prototype from earlier in this project	1	group	classroom	photograph of the group's prototype if the object could not be stored
Investigation Journal pages from earlier in this project (including Design Brief and test notes)	1	pupil	classroom	group notes on plain paper from the build and test sessions
presentation paper for short cue notes	1	group	classroom	plain A4 paper
pencils	1	pupil	classroom	biros

Safety watch-point

Prototypes move between tables during shares — remind groups to carry feeders with two hands and keep watering-can or loose parts off the floor.

Lesson 32

Teaching moves

- **What a design analysis includes:** Keep only the five-part checklist on the board. After the thirty-second partner talk on which part feels hardest, take two or three quick shares so the class hears that different groups struggle with different beats — then push past 'it looks nice' toward need → choice → evidence → change → next step.
- **Prepare your presentation:** Leave the five-point checklist visible. Circulating, stop groups that only describe looks and ask 'What did the watering-can test show?' and 'What changed after your first test?' Cue notes are a few words per point while someone holds the prototype. At eight minutes, move unfinished groups on — short and clear beats long and vague.
- **Share the feeder and the evidence:** Count groups before you start: six or fewer go to the front for about one minute plus a listener question; more than six do one paired round first, then two volunteer groups share with the class. Fold listeners in with 'Is their test evidence strong?' and model the stems 'One thing that was clear...' and 'One question I have about your design...'.
- **Peer questions on design choices:** Run think-pair-share on which design choice had the strongest evidence against holds-seed, stays-dry or stable-perch. Capture three or four ideas on the IWB under Strong evidence. Redirect any 'prettiest feeder' talk back to those success criteria and name iterative change after a failed balance test as strong engineering.
- **Record your design analysis:** Paper Investigation Journal only. If time is tight after presentations, require three lines in class — test evidence, what changed, one next step — and say that aloud so late presenters are not rushed. Offer stems for strugglers and check next steps are specific ('wider base so it does not tip'), not 'make it better'.
- **Reflect on the iterative process:** Display-only science talk on the two prompts only. Revoice answers that link a change to evidence and state plainly that engineers analyse the process, not only the finished object.

What it should show

Strong talks name a clear bird need (dry seed, gripable perch, stability), one justified design choice, what the watering-can or balance test actually showed, one evidence-linked change, and one specific next step. A neat build with no test link is a weak analysis — prompt for the trial result. Vague next steps ('make it better') need tightening to a concrete change tied to a success criterion.

Misconceptions & interventions

- **Pupils only describe how the finished feeder looks instead of the full arc from need to next step.** — Point at the five-part board checklist and ask them to start with 'The birds needed…' then 'The watering-can test showed…' before they mention materials or colour.
- **Pupils pick the 'best' feeder as the prettiest one.** — Redirect to the project's success criteria: holds seed, keeps seed dry, stable perch. Ask which group linked a failed test to a real change — that is the stronger analysis.
- **Pupils treat an early fail as a mistake to hide rather than iterative design working.** — Name it positively: 'Be honest about what failed first — that is the evidence that drove the improvement.' Have them state the change and the test result side by side.

Differentiation

Emerging	Developing	Proficient
• Assign one sentence each across the five points, with spoken stems: Our feeder needed to… / We chose… because… / The tests showed… / We changed… / Next we would… • If time is short, require only test evidence, what changed, and one next step on the journal page in class.	• Ask groups to separate what they saw in the test from what they think it means when they present. • Listener role: prepare one question about a design choice or the strength of the evidence.	• Add what they would keep the same next time and why, still tied to test evidence. • Fast finishers sketch one labelled improvement on the same journal page and note which success criterion it would help.

Cross-curricular hook

Links to English oral language: a timed group talk with evidence and peer questions, like explaining a project to a client.