engineering

Present the design analysis

Lesson at a glance

Open by framing pupils as engineers who must explain the story of their bird-feeder prototype, not only show it. Model the five-point design analysis (user need, one design choice, test evidence, what changed after testing, next step), then groups draft one-minute cue notes from their Investigation Journal and prototype. Groups present with listener questions, then record the full analysis on the journal page and close with a short display-only talk on iterative design.

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, set each group's finished feeder prototype and its earlier Design Brief and test-note journal pages on the tables. Put presentation paper and pencils ready. Keep the five-point checklist visible on the board from the start.

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 presentations — remind groups to carry feeders with two hands and keep watering-can water away from journals and floor.

Lesson 32

Teaching moves

- **Getting Started:** Point to the prototypes already on the tables and ask: what would an engineer say about this feeder that a photograph alone cannot tell us? Remind them they already know how to plan, build and fair-test — today is the share-and-explain part of the design process.
- **What a design analysis includes:** Display only the five headings. After the thirty-second turn-and-talk on which part feels hardest, take two or three quick shares. Head off groups that only describe looks by insisting on the whole story in order: need → choice → evidence → change → next step.
- **Prepare your presentation:** Keep the five-point checklist on the board. Circulating, stop groups that only describe appearance and ask: what did the watering-can test show, and what changed after the first test? Cue notes are a few words per point, not a poster. Move any group still drafting at eight minutes on to the talk.
- **Share the feeder and the evidence:** Decide pacing before you start: six groups or fewer go front for one minute each plus a listener question; more than six do a paired round first, then two volunteer groups to the class. Model stems: One thing that was clear... and One question I have about your design... Listen for links from a test result to a design change.
- **Peer questions on design choices:** Run think-pair-share on which design choice was backed by the strongest evidence. Capture three or four ideas on the board under Strong evidence. Redirect any talk about the prettiest feeder back to the project success criteria: holds seed, keeps seed dry, stable perch.
- **Record your design analysis:** Paper journal only. If time is tight, require three lines in class — test evidence, what changed, one next step — and finish user need and design choices for homework; say this aloud before writing starts. Prompt with stems: Our feeder needed to... The tests showed... Next we would... Check next steps are specific, not make it better.
- **Reflect on the iterative process:** No extra written task. Use two display-only prompts only and revoice answers that link a change to evidence. Name the Nature of STEM point plainly: engineers analyse the process, not only the finished object.

What it should show

A successful analysis names a clear bird need (dry seed, gripable perch, stability), one justified design choice, real test evidence from the watering-can or balance trials, a change linked to that evidence, and one specific next step. Vague next steps (make it better) or descriptions of looks only mean the group has not yet used the journal evidence — send them back to the test notes.

Misconceptions & interventions

- **Pupils only describe how the finished feeder looks instead of telling the design story.** — Point at the five-point checklist and ask them to start with what the birds needed, then what one test showed. Have them hold up the journal test notes as they speak.
- **Pupils think the best feeder is the prettiest one.** — Redirect to the agreed success criteria: holds seed, keeps seed dry, stable perch. Ask which presentation gave the strongest test evidence, not which build looked neatest.
- **Pupils treat a failed first test as a mistake rather than iterative design working.** — Revoice the journal tip: changing one thing because a test showed a problem, then testing again, is the process working. Ask what evidence drove their change.

Differentiation

Emerging	Developing	Proficient
• Assign one sentence each across the five points so every pupil speaks from a single stem. • Give oral stems at the journal page: Our feeder needed to… We chose… because… The tests showed… We changed… Next we would…	• Require the in-class minimum of three journal lines (evidence, change, next step) and finish the rest on the same page later. • Prompt listeners to use the modelled stems: One thing that was clear… One question I have…	• Add what they would keep the same next time and why, still tied to test evidence. • Sketch one labelled improvement on the journal page and note which success criterion it would help.

Cross-curricular hook

Link to Oral Language: one-minute structured talks with evidence and a peer question mirror real explanatory speaking.