

# Test, present and reflect

## Lesson at a glance

Groups bring out the prototype they built earlier in this project and restate the school problem and success criteria on their Design Brief. They run the planned test unchanged, jotting Trial 1 and Trial 2 on the brief, then write evidence, conclusion and one next step on the Investigation Journal page. Totals of criteria met feed the data-recorder interactive as a class bar chart. Each group presents the model for about 45 seconds before a display-only close on the full STEM cycle.

## Learning objectives

- Test the model against the problem and record the result
- Present the result using a chart or demo and the model itself
- Look back over the whole STEM cycle: investigate, build, evaluate, and communicate

## Before the bell – prep

Have every group's model and Design Brief ready. Clear one test space per group. Set out stopwatch or class clock, metre stick or tape, and only the loads, water or containers their Part 1 criteria already used. Open the data-recorder interactive (Group / Criteria met). Put a visible 45-second timer ready for presentations.

**Materials**

| Item                                                                   | Qty | Per   | Source     | Low-cost substitute                                                                                        |
|------------------------------------------------------------------------|-----|-------|------------|------------------------------------------------------------------------------------------------------------|
| prototype model from Capstone Part 1                                   | 1   | group | classroom  | photograph of the model plus the Design Brief if the physical build could not be stored                    |
| Design Brief from Capstone Part 1 (with success criteria)              | 1   | group | classroom  | a short list of the group's three success criteria on scrap paper                                          |
| loads, water or other criterion-specific test kit from Capstone Part 1 | 1   | group | classroom  | library books or filled water bottles as loads; a recycled yoghurt pot or ice-cream tub for any water test |
| stopwatch or class clock                                               | 1   | group | classroom  | the classroom wall clock counted aloud                                                                     |
| metre stick or tape measure                                            | 1   | group | school kit | a 30 cm ruler used end to end                                                                              |
| tablet or laptop for optional photo or chart                           | 1   | group | school kit | present from the model and Investigation Journal only                                                      |

**Safety watch-point**

Supervise test loads, water or containers from each group's own criteria; keep measuring kit shared and desks clear. No climbing on furniture to test height or strength.



### Teaching moves

- **Getting Started:** Hand out each group's model and Design Brief. Name the school problem they chose and the success criteria they agreed — adapt the cloakroom/yard examples to this class's real briefs. Pose the key question once: how will we know if our model really solves the problem?
- **Test the model:** Before they start, clear roles: one times or measures, one operates, one records on the Design Brief results space only — Investigation Journal stays closed. Model the I wonder / I predict / I test / I observed / I think spine with one group at the front. Walk the room and stop anyone changing the test mid-way; re-voice that evidence only counts if the test stays the same. Two trials if the criterion is numeric.
- **Record the result:** Open the Investigation Journal page. Circulate and push evidence language first: 'The model held...' before 'So I think...'. Look for one clear result linked to a criterion, a conclusion that matches the data, and one realistic next step. Treat a failed criterion as useful evidence, not a failed project.
- **Show the class chart:** Drive the data-recorder interactive in display mode. Collect every group's criteria-met total first, one row per group, then show the bars. Before the chart appears, say aloud that groups had different problems and criteria — bars are not a winner board. Run the talk prompts: which bars are tallest, what design choices sit behind them, and could a shorter bar still be strong for a harder brief? If criteria counts differ sharply, optionally re-tally as met all / some / none.
- **Present your analysis:** Leave the presentation spine and listener stems on the board. Enforce a visible 45-second timebox per group: problem, one design choice, test evidence, one next step, model in hand. After every two groups take one shared comment only. If transitions eat the clock, drop further listener comments and finish every group — protect step 6. After two or three groups, name the Nature of STEM cycle plainly: investigate, build, evaluate, communicate.
- **Reflect and close:** Display-only: take two or three spoken reflections on which part of investigate, build, evaluate and communicate mattered most and what they will take into the next STEM challenge. Celebrate useful failures as strongly as clean passes. Pack away models or photograph for display; return measuring kit and loads.

### What it should show

Outcomes vary by brief: expect a mix of met all, met some, and met none. A successful write-up links at least one measured or yes/no result to a stated criterion, separates what was seen from what it means, and names one realistic improvement. Odd 'perfect' passes often mean the test was eased mid-way — re-run against the original criteria on the Design Brief.

**Misconceptions & interventions**

- **Changing the test halfway (lighter load, shorter time, steadier hand) so the model looks better.** — Stop the group and point at the Design Brief criteria: evidence only counts if the test stays the same. Re-run Trial 2 exactly as planned and record what actually happens.
- **The tallest bar on the class chart means the best design.** — Re-voice the board reminder: groups had different problems and criteria counts. Ask whether a shorter bar could still be strong for a harder brief, and optionally re-tally as met all / some / none.
- **If a criterion failed, the whole project failed.** — Name the failed result as useful evidence. Push the journal next-step line: what would you change so the next prototype meets that criterion?

**Differentiation**

| Emerging                                                                                                                                                                                                                | Developing                                                                                                                                                                            | Proficient                                                                                                                                                                      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Use a simple yes/no checklist against each success criterion on the Design Brief; teacher scribes the journal conclusion from the pupil's spoken evidence sentence.</li> </ul> | <ul style="list-style-type: none"> <li>• Add one measured reading (time, distance or mass held) beside the yes/no result and link it to a single criterion in the journal.</li> </ul> | <ul style="list-style-type: none"> <li>• Critique whether their criteria were fair and hard enough, and propose one sharper criterion or test method for a redesign.</li> </ul> |

**Cross-curricular hook**

Tie to Maths Data — read the class bar chart of criteria met and discuss mode, range and why raw totals need careful comparison.