

Assessment Rationale — Egg-Drop Design Challenge (Chemical sciences)

Teacher-facing assessment rationale for the Chemical sciences summative 'Egg-Drop Design Challenge'. Maps each part and rubric criterion to the SCSA Year 4 Science content description (chemical sciences: processed/raw materials and physical properties) and achievement standard, explains the Design and Technologies integration, and justifies validity and fairness. For teacher/moderation use.

This document shows how the summative task **Egg-Drop Design Challenge** assesses the mandated WA Curriculum (SCSA) Year 4 Science content, and explains the design of the task and marking key. It is for teacher planning and moderation and is not given to students.

Curriculum content assessed

Strand / sub-strand	Content description (SCSA Year 4)
Science understanding — Chemical sciences	"Processed materials, including fibres, metals, glass and plastics, are made from raw materials, such as wool, ores, sand and oil, and have a range of physical properties that influence their use."
Science inquiry — Collaborating and applying	"Use science knowledge to propose explanations for observed phenomena and solutions to problems."
Science inquiry — Communicating	"Communicate ideas using scientific vocabulary."

Alignment with the Year 4 achievement standard

The Year 4 achievement standard states that students "investigate different materials and their properties and relate these to their use." The egg-drop challenge assesses precisely this relating of *property* to *use*: students must select materials **because** of the properties that suit the job of protecting an egg.

Task part	What it asks	Content / standard link
Part A — Plan and choose materials	Select materials and justify each by its physical property.	"Relate materials and their properties to their use" — the core Chemical sciences content.
Part B — Labelled design	Draw and label the design, showing each material's placement.	Design and Technologies "labelled drawings, technical terms"; communicating scientific ideas.
Part C — Safety	Identify a risk and how to manage it.	Inquiry: "consider the material and equipment risks."
Part D — Test and reflect	Test the design and evaluate which property worked, then improve it.	"Use science knowledge to propose explanations and solutions"; evaluating and proposing improvements.

How the marking key reflects the standard

The criterion carrying the most weight — *Choosing materials by their properties* (35) — targets the mandated understanding that properties influence use. *Design, labelling and safety* (30) covers the applied design and the inquiry requirement to consider risks. *Testing, evaluating and improving* (20) assesses the "propose solutions" and evaluating content. *Communication and scientific vocabulary* (15) assesses the communicating content. The High / Sound / Limited descriptors mirror the SCSA judging-standard language for defensible, moderatable judgements.

Why this task is valid and fair

- **It builds on the taught sequence.** Students learn property vocabulary and fit-for-purpose reasoning (Lesson 5), raw vs processed materials (Lesson 6) and fair testing of a property (Lesson 7) before applying all of this in the design challenge — so the task assesses developed learning.
- **It is a performance of understanding, not recall.** Choosing and justifying materials for a real problem is a more authentic measure of "properties influence use" than a definition test, and it gives able students room to reason while remaining accessible to all.
- **It is inclusive.** The labelled diagram lets students show understanding visually; group building with individual written responses supports collaboration while still producing individual evidence. Adjustments (sentence starters, scribing, a partly-labelled template) support access without lowering the demand of the science.

Cross-curriculum and capabilities. The task integrates the **Design and Technologies** design process (investigate → design → produce → evaluate) and develops **Critical and Creative Thinking** (generating and testing ideas, then improving them). A brief discussion of which materials can be recycled links to **Sustainability**.

Moderation note. Because designs vary, moderate on the *quality of the property-to-use reasoning* and the reflection, not on whether the egg survived. A cracked egg with excellent reasoning can still be High.