

Marking Guide and Model Answers — Waste Rock Stockpile Investigation (A3-EARTH)

Teacher marking pack for the Earth and space sciences summative 'Waste Rock Stockpile Investigation'. Contains a full model answer / exemplar response for every part, a comprehensive annotated marking guide for the four (inquiry-weighted) rubric criteria, a worked on-balance judgement, and notes on marking adjusted (ABLEWA) responses. For teacher and moderation use only.

This pack supports fair, consistent marking of the **Waste Rock Stockpile Investigation**. It contains a model exemplar, an annotated marking guide for each rubric criterion, a worked on-balance judgement, and notes for marking adjusted responses. It is for teacher and moderation use — not shown to students beforehand.

Golden rule of marking this task: judge the quality of the *fair-test plan* and the *science explanation* — **not** how little leaked. A design that leaked but is well planned and well explained can still be a High. Students should expect *less* leaching than the uncovered pile, not none.

Model exemplar response (a "High" answer)

Part A — plan (model). Question: "Will covering the waste-rock pile reduce how much coloured 'acid' washes out when it rains?" Prediction: "Yes, because the cover will stop some rain soaking into the pile, so less will wash out." Fair-test plan: *Change* — whether the pile is covered (and with what). *Measure/observe* — how much colour washes into the tray. *Keep the same* — the size of the pile, the amount of dyed salt, the amount of water and how it is poured.

Part B — safety (model). "Risk: water and dyed salt could spill and make the floor slippery, or stain. Manage it: work over a tray, wipe spills straight away, and wash hands after."

Part C — design & result (model). A labelled drawing of the pile covered with a layer of small rocks and a plastic sheet, in a tray. Result: "The uncovered pile leaked a big patch of colour. My covered pile leaked only a small patch — much less."

Part D — explain & improve (model). "The cover worked because it stopped some of the rain reaching the salt, so less was eroded and washed out (less chemical weathering and erosion). To improve it, I would add a layer of soil and plants on top, because roots hold material in place and soak up water, so even less would wash out."

Comprehensive marking guide — applying the four criteria

This marking key is **inquiry-weighted** because the content description sits alongside four inquiry sub-strands.

1. PLANNING A FAIR INVESTIGATION (30)

Band	What you should see
High (5–6)	Clear question and reasoned prediction; correctly identifies what to change, what to measure/observe, and what to keep the same.
Sound (3–4)	Question and prediction; identifies the variable to change and something to keep the same.
Limited (1–2)	With guidance, identifies a variable; plan is incomplete.

Look for / common issues: the frequent slip is naming only what to change but not what to keep the same — the "keep the same" list is what makes it fair, so weight it.

2. IDENTIFYING AND MANAGING RISK (15)

Band	What you should see
High (4)	Names a safety risk and a sensible way to manage it.
Sound (2–3)	Names a safety risk.
Limited (1)	Lists a risk with little detail.

3. CONDUCTING, OBSERVING AND RECORDING (30)

Band	What you should see
High (5–6)	Clear labelled design; conducts the test; records a careful observation <i>comparing</i> the run-off with the uncovered pile.
Sound (3–4)	Labelled design and a record of what happened.
Limited (1–2)	Basic design and observation with little detail.

Look for: the **comparison** to the uncovered pile is the key evidence of High here — "less than the uncovered one", not just "some leaked".

4. EXPLAINING RESULTS AND IMPROVING USING SCIENCE (25)

Band	What you should see
High (5–6)	Explains the result using correct weathering/erosion knowledge and proposes a sensible improvement, with good scientific vocabulary.
Sound (3–4)	Explains with some science understanding and suggests an improvement.
Limited (1–2)	States what happened with little scientific explanation.

Worked on-balance judgement

A student writes a clear question and prediction and a complete fair-test plan (Planning 6/6), names a spill risk and management (Risk 4/4), draws a labelled covered pile and records "less colour than the uncovered pile" (Conducting 5/6), but their explanation says only "the cover stopped the water" without using weathering/erosion words and offers a vague improvement (Explaining 3/6). Total $\approx 18/22 \rightarrow$ **High**: the strong plan, risk and comparative observation outweigh a thinner explanation.

Marking adjusted (ABLEWA) responses

Where a student used the additional-support approach (placing plan cards, building the model, pointing to which pile leaked more, yes/no responses, a "more/less cover" improvement), mark the science evidence. Placing the change/keep-the-same cards is valid for Planning at an emerging level; pointing to the smaller leak is valid for Conducting/observing. Record adjustments beside the result; see the lesson's additional-support approach for Stage A–D descriptors.

Co-mark 3–4 scripts across the range first, and re-anchor the "don't mark how little leaked" rule before you start.