Earth and Environmental Science

HSC · 2017 SYLLABUS · TEACHER BRIEF

What eight HSC papers tell us about 2027

Every question from 2019–2026 analysed by syllabus dot point, outcome, command verb and stimulus · Prepared November 2026 for EES teachers

43% *start here, page 3*

of all marks went to **11 dot points**, each examined in 7–8 of 8 papers

2

parts worth **7–9 marks** in every paper; in 7 of 8 papers one drew on **two or more modules**

72%

of 2026 marks came with a **stimulus** (36% in 2019); half the paper had a graph, table or diagram

45/45

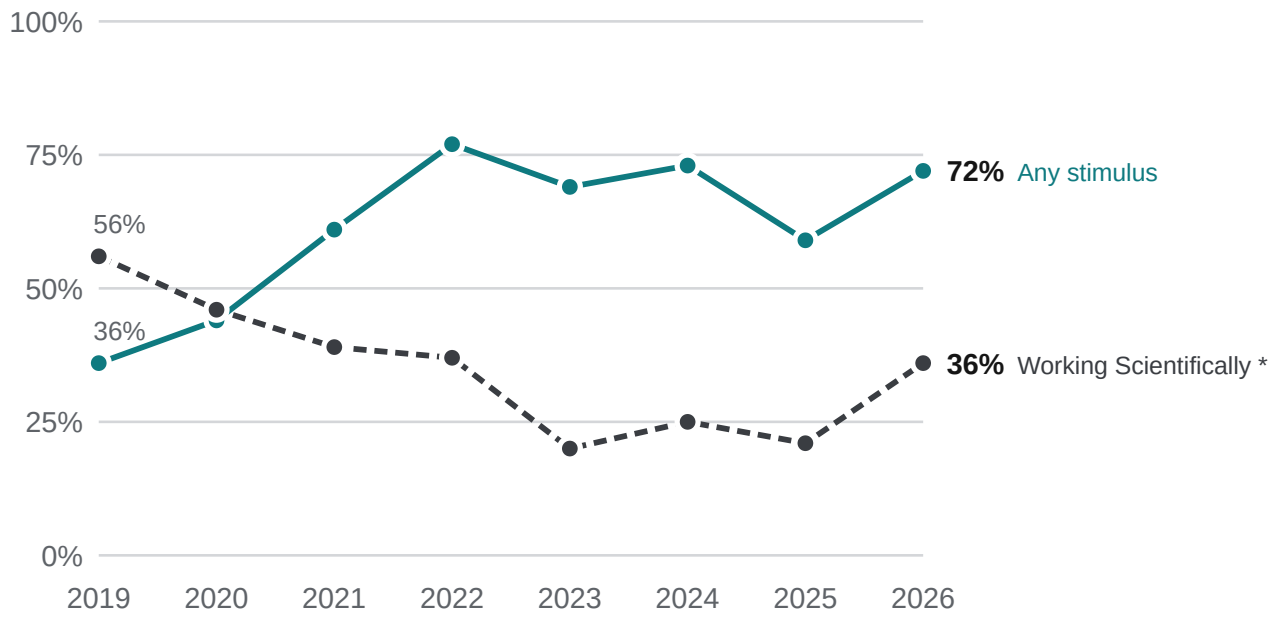
dot points examined, all by 2023. **None was new in 2024–2026**; the gaps are now inside dot points

Five things to act on

1. **Secure the 11 core dot points** (page 3). They carried 341 of 800 marks. Four were examined in every paper.
2. **Rehearse the cross-module 8-marker.** In 2021 and every paper from 2023, one question asked students to link TWO modules, concepts or examples to a statement, a pair of images or a list. It was Analyse four times and Evaluate once (2025).
3. **Teach Hazards as a block** (page 4). Geological disasters (M6.IQ1) took 7–16 marks in every paper, split over six dot points, so only one Module 6 dot point reaches the watch-list's top 15.
4. **Train students to use the stimulus, and to draw.** About 32 marks per paper sit on questions that need data from a graph, table, map or source. Flow charts were asked in 5 of 8 papers; no graph has been plotted since 2022.
5. **Close the gaps inside dot points** (page 5). 2027 and 2028 are the last two papers on this syllabus. One required item has never been asked (underground mining methods) and nine more only lightly.

More of the paper now comes with a stimulus; the Working Scientifically share fell, then rose again in 2026

% of each paper's marks on questions with any stimulus (graphs, tables, diagrams, text scenarios and statements), and the share of marks mapped to Working Scientifically outcomes 1–7*. Questions with a graph, table or diagram carried 32–70% (average 44.5%), with no trend.

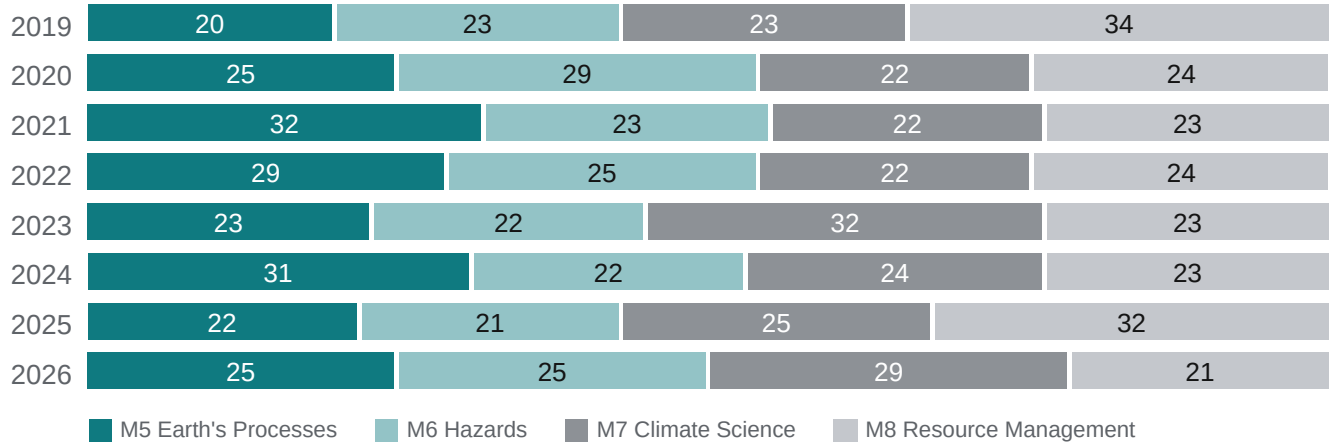


* Each question's marks are split equally across the outcomes in NESA's mapping grid: 56% in 2019, 20–25% in 2023–2025 and 36% in 2026 (average 35%). Counted the other way, 42–96 marks per paper (average 66.5) sit on questions mapped to at least one Working Scientifically outcome, because most questions test skills and content together. School tests set their own Working Scientifically/content split per assessment task.

How the paper is built

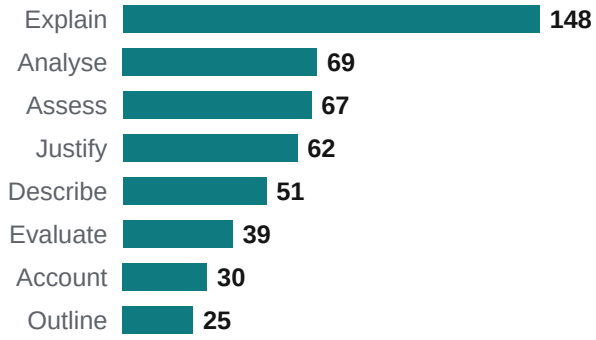
No module can be under-taught: each takes 20–34 marks of every paper

Marks per module (out of 100), by the module each question was mainly about. Totals over eight papers: M5 207, M6 190, M7 199, M8 204.



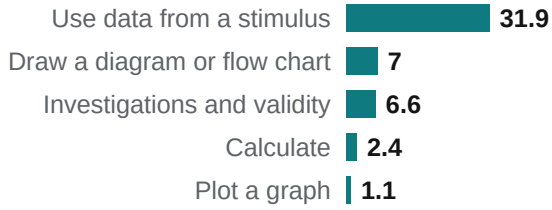
Section II command verbs

Marks 2019–26, of 640; two-verb parts split. Analyse, Assess, Justify and Evaluate together carry 240, more than Explain.



What students have to do

Average marks per paper on parts needing each skill. Planning or running an investigation: 0–11 marks per paper. A few parts beyond "Calculate" need quick arithmetic.



The biggest questions: two parts worth 7–9 marks in every paper; 7 of the 16 were Analyse

Year	Parts worth 7+ marks (marks, verb, modules) and what they asked
2019	Q29 (7, Evaluate, M6) weather-prediction technologies · Q35 (9, Analyse, M7+8) Working Scientifically skills
2020	Q34 (7, Analyse, M7+8) Aboriginal and Torres Strait Islander practices · Q36 (8, Assess, M6) bushfires
2021	Q25 (7, Assess, M8) sustainability of resources · Q33 (8, Analyse, M5+7+8) "new mass extinction"; TWO modules
2022	Q31 (7, Design, M5) a valid procedure to test a hypothesis · Q34 (7, Analyse, M5) origin and development of the biosphere
2023	Q31 (7, Evaluate, M8) traditional owners and mining · Q35 (8, Analyse, M5+7+8) day and night images of Earth; TWO modules
2024	Q32b (7, Justify, M7) adapting to El Niño and La Niña · Q33 (8, Analyse, M5–8) Earth's spheres and humans; TWO examples
2025	Q27 (8, Evaluate, M6+7+8) planting native trees; TWO unrelated examples · Q34 (8, Account, M5) Rodinia to Pangaea
2026	Q32 (7, Evaluate, M7) validity of four sources on pollen · Q34 (8, Analyse, M7+8) "we must all live more simply"; TWO concepts

What it means for teaching

- **The cross-module question never names a dot point.** Give students two rehearsed cause-and-effect chains to bend to any prompt.
- **Short answers still decide the paper.** Parts worth 3 or 4 marks carry 369 of the 640 Section II marks; the two long parts carry 14–16 marks per paper.
- **Investigations:** a valid method (2022 Q31, 2025 Q25b), validity against reliability and accuracy, judging sources (2026 Q32).
- **Aboriginal and Torres Strait Islander knowledge** was asked directly in 6 of 8 papers (3–11 marks), including every paper from 2023.

Teach these reliably

Each of these 11 dot points had a question mainly on it in **7 or 8 of the 8 papers**; together those carried **341 of 800 marks (43%)**.

Dot point	Papers	Marks 2019–26	How it is examined, and what top answers do
Mitigation and adaptation strategies M7.IQ4.DP3	**8/8**	**45**	Assess or justify strategies: geo-engineering (2019, 2025), blue carbon (2022), El Niño and La Niña (7 marks, 2024). Top answers say which of the two it is and support a judgement.
Dating geological events *superposition, fossils, absolute dating* M5.IQ4.DP3	**8/8**	**43**	Stratigraphic sequences with radiometric data (8 marks, 2019), relative against absolute dating, half-life MCQs, mass extinctions. Name the principle and link it to the age.
Origin of organic molecules M5.IQ1.DP1	**8/8**	**26**	An MCQ most years, plus 3–4 mark explanations of black smokers (2021), Urey–Miller (2023), panspermia (2024). Link the evidence to early-Earth conditions.
Mining impacts and reclamation M8.IQ1.DP2	**8/8**	**15**	MCQs on monitoring data and stages of rehabilitation; one longer written part (5 marks, 2024) justifying reclamation methods at a closed mine.
Human activities and sustainability M8.IQ3.DP2	**7/8**	**44**	Fisheries data, then account or justify (2022; 5 marks, 2026), and three long questions (2019, 2021, 2025). Judge the sustainability of a named resource, not general harm.
How life changed the other spheres M5.IQ2.DP1	**7/8**	**40**	Oxygen graphs, banded iron formations (6 marks, 2020), design an investigation (7 marks, 2022). Give the mechanism: oxygen from cyanobacteria oxidised dissolved iron.
Human influence since the Industrial Revolution M7.IQ3.DP2	**7/8**	**34**	Ocean acidification (2019; shell-mass investigation, 2023), temperature and isotope data (2022). Mainly on it: only 2 marks in 2024–2026, but it came into questions worth 75 overall.
Modelling the plate tectonic supercycle M5.IQ3.DP1	**7/8**	**26**	Order the stages, assess a model (5 marks, 2023), Rodinia to Pangaea with cross-sections (8 marks, 2025).
Ancient evidence of temperature change M7.IQ2.DP1	**7/8**	**24**	Sedimentary rocks and pollen (2019, 2021), MCQs, validity of four sources (7 marks, 2026). Link a named proxy to a specific climate condition.
Sustainability of a named waste option M8.IQ2.DP3	**7/8**	**24**	Justify or evaluate options from recovery or audit data (6 marks, 2026), or discuss one named option (2022). Keep “organic waste” and “recycling” apart.
Recent evidence of climate variation M7.IQ2.DP2	**7/8**	**20**	Mostly MCQs matching evidence to what it records; written on Aboriginal art (2019) and tree rings with rock types (8 marks, 2023).

Very likely in 2027, on past form

- Two parts worth **7–9 marks**, one probably asking for TWO modules, concepts or examples.
- A **mitigation or adaptation** question and a **dating** question: both examined every year.
- A **waste management** question: M8.IQ2 took 5–13 marks in every paper.
- **Stimulus on most of the paper** (59–77% of marks since 2021).

The 2027 watch-list

How it is ranked: each dot point's average marks per paper, plus a bonus for appearing in more papers. Built from earlier papers only, the top 15 held **43 of the 100 marks** in each 2022–26 paper, on average (how we tested it: page 6). EES spreads its marks widely: outside the top 15, no dot point averages 3 marks per paper.

	Dot point	19	20	21	22	23	24	25	26	Papers	Marks per paper
1	**Mitigation and adaptation strategies** M7.IQ4.DP3	3	7	5	6	4	8	4	8	8/8	5.6
2	**Dating geological events** M5.IQ4.DP3	11	1	12	1	3	3	6	6	8/8	5.4
3	**Human activities and sustainability** M8.IQ3.DP2	10	1	7	11	·	2	8	5	7/8	5.5
4	**How life changed the other spheres** M5.IQ2.DP1	4	6	·	12	4	8	3	3	7/8	5.0
5	**Human influence since the Industrial Revolution** M7.IQ3.DP2	6	3	2	7	14	1	·	1	7/8	4.2
6	**Origin of organic molecules** M5.IQ1.DP1	3	1	4	8	3	5	1	1	8/8	3.2
7	**Modelling the plate tectonic supercycle** M5.IQ3.DP1	1	3	3	·	5	1	12	1	7/8	3.2
8	**Ancient evidence of temperature change** M7.IQ2.DP1	8	1	5	·	1	1	1	7	7/8	3.0
9	**Sustainability of a named waste option** M8.IQ2.DP3	3	4	1	5	1	·	3	7	7/8	3.0
10	**Causes of natural climate variation** M7.IQ1.DP2	·	3	·	1	1	5	13	1	6/8	3.0
11	**Effects of the supercycle on climate and evolution** M5.IQ3.DP2	·	5	3	4	1	5	·	4	6/8	2.8
12	**Recent evidence of climate variation** M7.IQ2.DP2	5	1	1	1	9	·	2	1	7/8	2.5
13	**Index fossils and the Geological Time Scale** M5.IQ4.DP2	·	5	6	4	1	4	·	1	6/8	2.6
14	**Management options for solid waste** M8.IQ2.DP2	5	3	5	·	4	3	·	1	6/8	2.6
15	**Climatic phenomena and a local ecosystem** M6.IQ2.DP4	1	8	·	5	1	1	·	4	6/8	2.5

Marks per paper: 0 · 1–2 · 3–4 · 5–7 · 8+

Columns are years 2019–2026 · Papers = papers with a question mainly on it · Marks per paper = average over 8 papers

Next on the list (16–20)

- Technologies that minimise volcano and earthquake disasters M6.IQ3.DP2 · 4/8 papers, 2.9 marks per paper
- Flow-on effects of climate change M7.IQ3.DP3 · 5/8 papers, 2.6 marks per paper
- Waste audit investigation M8.IQ2.DP1 · 6/8 papers, 2.4 marks per paper
- Mining impacts and reclamation M8.IQ1.DP2 · 8/8 papers, 1.9 marks per paper
- Earthquake hazards M6.IQ1.DP3 · 6/8 papers, 2.2 marks per paper
- Level with 19 and 20 on score: magma type and explosivity M6.IQ1.DP5 and the Australian resource case study M8.IQ1.DP4
- **Light lately:** EES topics have partly rotated, so the resource case study and predicting earthquake and volcano zones M6.IQ1.DP1 (both none in 2025–26) are worth a look. A weak signal: it rests on five test papers.

One block the dot-point list hides: Hazards

Geological disasters (M6.IQ1) took **7–16 marks in every paper**, 88 marks in all, but they are split over six dot points and none ranks above 20: earthquake hazards, focus depth at convergent and divergent boundaries, magma type and explosivity, volcanic hazards, predicting zones from plate-boundary data, and when a hazard becomes a disaster. Technologies for predicting and minimising disasters (M6.IQ3) added 4–11 marks in every paper. Expect a multi-part question built on a map, graph or named event: the Mansfield earthquake (2022), Mount Ruapehu (12 marks, 2024), tsunami figures (2025), earthquake technology and focus depths at two locations (9 marks, 2026). Mount Pinatubo, the eruption the syllabus names, carried 10 marks in 2023 and a 6-mark Analyse in 2026.

The last two papers: content rarely or never asked

watch this space

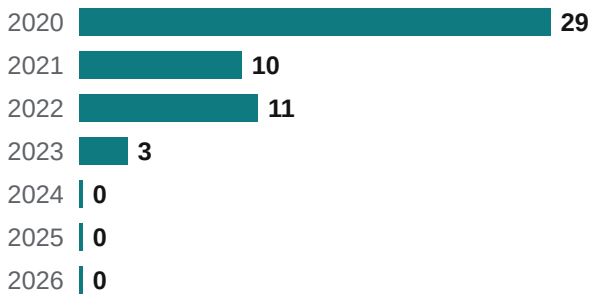
All 45 dot points have had a question mainly on them, all had come up by 2023, and the last three papers brought in none for the first time. What remains is content **inside** dot points: one required item never asked, and others seen only in MCQs, marking guidelines or for a mark or two, each checked against the full text of every question and marking guideline. Expect MCQs or 2–4 mark parts on these.

Required content never asked	Syllabus wording	Examined so far	One thing to prepare
Underground mining methods M8.IQ1.DP2.b	"including"	pictured once (2025 Q12, an MCQ on reclaiming the site); the method never asked	One method, e.g. longwall coal mining: subsidence, cracked stream beds; backfill and seal shafts.
Examined only lightly			
Human activities and droughts or floods M6.IQ2.DP5.a	"including"	no question on it; accepted in marking guidelines (2019 Q35 drought, 2024 Q32b floods); one MCQ on a flood-mitigation dam (2022 Q17)	Land clearing and hard surfaces raise run-off and flood peaks; over-extraction from rivers deepens drought downstream.
Agricultural resources: terrestrial and aquatic M8.IQ1.DP1.a	"including"	never asked to name or locate them; fisheries appear under overharvesting, crops only in passing	Name and locate one of each, e.g. wheat in the WA wheatbelt and farmed salmon in Tasmania.
Ice cores: gas bubbles and oxygen isotopes M7.IQ2.DP2.a	"including"	8 MCQs; never the focus of a written question (one example in the 2019 Q35 sample answer)	Trapped air gives past CO_2 directly; the oxygen isotope ratio of the ice gives temperature.
Changes in Earth's orbit M7.IQ1.DP2.c	"including"	5 MCQs (2021, 2022, 2023, 2024, 2026); never written	Eccentricity, tilt and precession pace glacial cycles over tens of thousands of years or more.
Isotope ratios in rocks and deep-sea sediments M7.IQ2.DP1.d	"including"	1 MCQ, answered by corals (2023 Q20); in two sample answers	Marine shells hold more ^{18}O relative to ^{16}O in glacial periods, so a sediment core records temperature.
Alternative energy sources as mitigation M7.IQ4.DP3.c	"including"	2 MCQs (2021 Q8, 2026 Q13); in four sample answers	Emissions avoided when wind or solar replaces coal, against intermittency and storage.
Aboriginal art sites as evidence M7.IQ2.DP2.c	"including"	2 marks (2019 Q33a)	E.g. rock art of thylacines in northern Australia; why art is hard to date.
Offshore and onshore drilling M8.IQ1.DP2.c	"including"	1 MCQ (2022 Q16)	Decommissioning: plug the well, remove the platform and pipeline, clear the sea floor.
Comparing explosive and effusive eruptions M6.IQ2.DP1	Whole dot point	4 marks (2019 Q30b)	Compare from data: ash and SO_2 reaching the stratosphere against local lava flows and gas.

Outcomes: EES12-1 (questioning and predicting) has appeared in NESA's mapping grid once (9 marks, 2019) and EES12-3 (conducting investigations) in four papers for 1–7 marks. A hypothesis question would be fair game.

First-time content each year

Marks on questions bringing in a dot point not seen in an earlier paper



Not required: "for example" content

One example of the dot point is enough.

- Land councils and legislation protecting Country and Place (M8.IQ3.DP3)
- Local waste facilities and demand for recycled waste (M8.IQ2.DP3)
- Not a gap: fossils as climate evidence (fossil pollen, 7 marks, 2026)

Also on the radar

Other whole dot points examined lightly

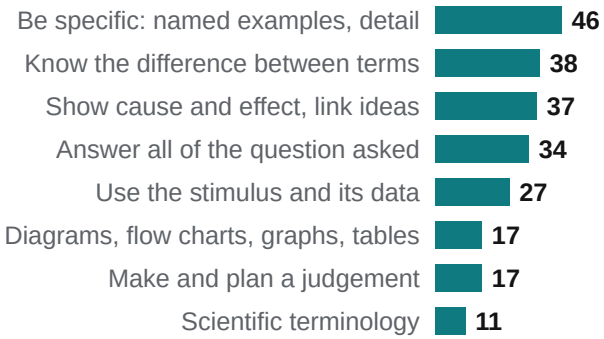
Questions mainly on each carried 8 marks or fewer over eight papers.

- Photosynthetic life, cyanobacteria and stromatolites M5.IQ1.DP2 · 1 mark, but it came into questions worth 15
- A major eruption changing climate M6.IQ2.DP2 · 4 marks, but it came into questions worth 27
- Conquest of land by plants and animals M5.IQ1.DP4 · 8 marks (4 in 2026)
- When a hazard becomes a disaster M6.IQ1.DP6 · 7 marks
- Human causes of enhanced greenhouse M7.IQ4.DP1 · 7 marks
- A sustainability initiative in the community M8.IQ3.DP4 · 7 marks
- Multicellular life: Ediacaran and Cambrian fauna M5.IQ1.DP3 · 6 marks
- Daily-life actions to cut emissions M7.IQ4.DP2 · 3 marks

What markers reward

What NESA markers asked students to improve

Of the 101 questions with an “areas to improve” comment (2019–2025), the number where a comment raised each theme



- **Specific, not general.** Name the mine, the eruption, the waste option, the technology. Answers that are too general are the markers' most common complaint.
- **Cause, then effect.** Join each fact to its consequence rather than listing effects.
- **Answer what was asked.** Plurals, BOTH and TWO, and the verb; adaptation when it says adaptation (2024 Q32).
- **Use the stimulus.** Quote numbers and refer to every figure named.
- **Draw properly.** Arrows in flow charts, labelled cross-sections, a key.

Commonly confused ideas

Each was flagged in NESA marker feedback, 2019–2025.

- greenhouse effect vs ozone depletion
- mitigation vs adaptation
- sustainable vs renewable vs recyclable
- hazard vs disaster
- validity vs reliability vs accuracy
- back burning vs hazard reduction burning
- relative vs absolute dating
- ancient vs recent climate evidence
- geo-engineering vs other mitigation
- earthquake frequency vs magnitude

Method

- **Data:** all 340 question parts from the 2019–2026 HSC Earth and Environmental Science papers (800 marks), Each part is counted once, under the dot point it was mainly about; “came into” counts every dot point a question drew on.
- **Skills, verbs and stimulus** were judged twice, independently, from the questions and marking guidelines. **Marker feedback:** all 325 “areas to improve” comments for 2019–2025 were read; 2026 feedback is not yet published.
- **Patterns, not knowledge of the paper:** NESA can examine any dot point.
- **Watch-list test:** each year’s list (2022–26) was built from earlier papers only; questions mainly on its top 15 were worth 59, 40, 45, 25 and 47 of that paper’s 100 marks (43 on average). **EES topics partly rotate:** a dot point’s heavy year tends to be followed by a lighter one, and a “due” bonus would have caught more marks in 2022–26 (47 a paper, not 43).

References

1. NESA. *HSC exam papers: Earth and Environmental Science*, 2019–2026 (papers, marking guidelines, mapping grids, marker feedback), nsw.gov.au/education-and-training/nesa/curriculum/hsc-exam-papers/earth-and-environmental-science; and *Earth and Environmental Science Stage 6 Syllabus* (2017).

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