

# FOR TEACHERS ONLY

The University of the State of New York  
REGENTS HIGH SCHOOL EXAMINATION

## EARTH AND SPACE SCIENCES

Wednesday, August 20, 2025 — 8:30 to 11:30 a.m., only

### RATING GUIDE

**Directions to the Teacher:**

Refer to the directions on page 2 before rating student papers.

Updated information regarding the rating of this examination may be posted on the New York State Education Department's web site during the rating period. Check this web site at: <https://www.nysed.gov/state-assessment/high-school-regents-examinations> and select the link "Scoring Information" for any recently posted information regarding this examination. This site should be checked before the rating process for this examination begins and several times throughout the Regents Examination period.

## Directions to the Teacher

Follow the procedures below for scoring student answer papers for the Regents Examination in Earth and Space Sciences. Additional information about scoring is provided in the publication *Information Booklet for Scoring Regents Examinations in the Sciences*.

Allow 1 credit for each correct response.

At least two science teachers must participate in the scoring of the open-ended questions on a student's paper. Each of these teachers should be responsible for scoring a selected number of the open-ended questions on each answer paper. No one teacher is to score more than approximately one-half of the open-ended questions on a student's answer paper. Teachers may not score their own students' answer papers.

Students' responses must be scored strictly according to the Rating Guide. For open-ended questions, credit may be allowed for responses other than those given in the rating guide if the response is a scientifically accurate answer to the question and demonstrates adequate knowledge as indicated by the examples in the rating guide. Do not attempt to correct the student's work by making insertions or changes of any kind. On the student's separate answer sheet, for each question, record the number of credits earned and the teacher's assigned rater/scorer letter.

Fractional credit is *not* allowed. Only whole-number credit may be given for a response. If the student gives more than one answer to a question, only the first answer should be rated. Units need not be given when the wording of the questions allows such omissions.

For hand scoring, raters should enter the scores earned in the appropriate boxes printed on the separate answer sheet. Next, the rater should add these scores and enter the total in the space provided. Then the student's raw score on the test should be converted to a scale score by using the conversion chart that will be posted on the Department's web site at: <https://www.nysed.gov/state-assessment/high-school-regents-examinations> no later than August 20, 2025. The student's scale score should be entered in the box labeled "Scale Score" on the student's answer sheet. The scale score is the student's final examination score.

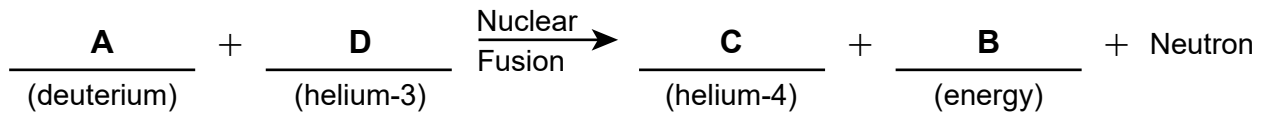
**Schools are not permitted to rescore any of the open-ended questions on this exam after each question has been rated once, regardless of the final exam score. Schools are required to ensure that the raw scores have been added correctly and that the resulting scale score has been determined accurately.**

Because scale scores corresponding to raw scores in the conversion chart may change from one administration to another, it is crucial that, for each administration, the conversion chart provided for that administration be used to determine the student's final score.

The test item map on page 11 identifies the Performance Expectation with which each test question is aligned. All NYSP-12SLS Performance Expectations are three-dimensional (<https://www.nysed.gov/sites/default/files/programs/standards-instruction/p-12-science-learning-standards.pdf>). The integration of these three dimensions provides students with a context for the content of science (DCI), the methods by which science knowledge is acquired and understood (SEP), and the ways in which the sciences are connected through concepts that have universal meaning across the disciplines (CCC).

- 1 [1] Allow 1 credit for a correctly completed equation with letters *A* and *D* on the left side of the arrow and letters *C* and *B* on the right side of the arrow.

**Example of a 1-credit response:**



**Note:** Allow credit if student identifies components with words or chemical symbols instead of letters.

- 2 [1] Allow 1 credit for 1.

- 3 [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Higher frequency radiation is emitted at times near maxima in the solar cycle.
  - Solar irradiance is higher when the number of sunspots is higher.

- 4 [1] Allow 1 credit for 4.

- 5 [1] Allow 1 credit for 3.

- 6 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

Property of water:

- When water freezes, it expands by about 10%.
- Water expands when it freezes.

Relative amount of deformation:

- Concrete samples with rebar have a lower deformation with fewer freeze-thaw cycles than concrete without rebar.
- Concrete samples without rebar have a higher deformation than samples with rebar.

- 7 [1] Allow 1 credit for 3.

- 8 [1] Allow 1 credit for 2.

- 9 [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- The diversion of water through tunnels above the level of Horseshoe Falls resulted in less water flowing over the falls and a slower rate of erosion.
  - Less water flowing over Horseshoe Falls due to diversion above the falls resulted in a slower rate of erosion at the falls.

10 [1] Allow 1 credit for 1.

11 [1] Allow 1 credit for 2.

12 [1] Allow 1 credit for a correct description *and* explanation. Acceptable responses include, but are not limited to:

Difference in wavelength:

- The wavelengths have become greater or longer.
- The wavelengths show a red shift.

How the universe changed:

- The change to greater wavelengths is evidence for the expansion of the universe.
- Red shift is evidence that the universe has expanded.

**Note:** Evidence for evolution of changing universe must include that the universe is expanding/getting bigger.

13 [1] Allow 1 credit for 4.

14 [1] Allow 1 credit for correctly completing the passage with *three* correct responses, as shown below:

A: less

B: greater

C: less

15 [1] Allow 1 credit for 1.

16 [1] Allow 1 credit for 4.

17 [1] Allow 1 credit for 4.

- 18 [1] Allow credit for indicating correct air mass designations for *both* air masses, as shown below *and* allow credit for a correctly completed table, as shown below. Allow credit if a symbol other than a checkmark is used.

Air Mass A: cP or cA

Air Mass B: mT

Weather Conditions	Increases	Decreases
cloud cover	✓	
chance of precipitation	✓	
air temperature		✓

- 19 [1] Allow 1 credit for 1.

- 20 [1] Allow 1 credit for an acceptable response. Acceptable responses include, but are not limited to:

- From 12 to 24 hours after landfall, a major hurricane’s wind speed decreased from approximately 60 knots to approximately 45 knots, which means air pressure increased.
- From 12 to 24 hours after landfall the wind speed drops, so atmospheric pressure must have increased.
- A decrease in wind speed (between 12 and 24 hours) means the air pressure has increased.

- 21 [1] Allow 1 credit for 3.

- 22 [1] Allow 1 credit for 2.

- 23 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- Stromatolites carried out photosynthesis, which removed CO<sub>2</sub> from the ocean and atmosphere, and increased oxygen levels into the atmosphere.
- For about 2 billion years, stromatolites have added oxygen to Earth’s atmosphere through photosynthesis.

- 24 [1] Allow 1 credit for *two* correctly completed claims that include a circled choice and the related result. Acceptable responses include:

<b>Percent of plant cover</b>	<b>Circled Choice:</b>	<b>Claim 1 (runoff)</b>
	increase	— decrease/becomes less
	decrease	— increase/becomes greater
	<b>Circled Choice:</b>	<b>Claim 2 (soil erosion)</b>
	increase	— decrease/becomes less
	decrease	— increase/becomes greater

- 25 [1] Allow 1 credit for 2.

- 26 [1] Allow 1 credit for *both* a correct water table depth and an effect on Well A and Well B residents. Acceptable responses include, but are not limited to:

Water table depth:

- The water table would drop to a lower level compared to its previous location.
- The level of the water table would be farther from the surface than its previous location.

Effect on Well A and Well B residents:

- Well A residents could be without water, while Well B residents could still have access to water.
- Well A residents could experience greater salt water contamination than Well B because Well A extends into the Upper Glacial Aquifer, which is in contact with ocean water.

- 27 [1] Allow 1 credit for an acceptable response with a letter and correct geologic process. Acceptable responses include, but are not limited to:

Letter of Model	Geologic Process
A	<ul style="list-style-type: none"> <li>— rising magma by thermal convection</li> <li>— matter cycled upward from Earth's interior</li> </ul>
B	<ul style="list-style-type: none"> <li>— magma rises to area of lower pressure due to density differences</li> <li>— magma rises at mid-ocean ridge as tectonic plates diverge</li> </ul>
C	<ul style="list-style-type: none"> <li>— tectonic plates converge, causing subduction of oceanic plate creating less-dense magma that rises back to surface</li> <li>— magma forms under subduction boundary and rises to surface</li> </ul>
D	<ul style="list-style-type: none"> <li>— marble created from heat and pressure of converging plates</li> <li>— basin is uplifted by heat and pressure of converging plates</li> </ul>

**Note:** Do *not* allow volcanism as a geologic process because volcanism is a surface feature that results from the cycling of matter (convection).

- 28 [1] Allow 1 credit for 3.

- 29 [1] Allow 1 credit for 2.

- 30 [1] Allow 1 credit for 1.

- 31 [1] Allow 1 credit for 3.

- 32 [1] Allow 1 credit for 3800 cm *and* an acceptable explanation. Acceptable explanations include, but are not limited to:

- A 3800 cm change in distance would not considerably affect the Moon's period of revolution since it is such a small value compared to the distance between the Moon and Earth.
- A distance change of 3800 cm is very small compared to 384,400 km, causing very little change in the period of the Moon's revolution.

- 33** [1] Allow 1 credit for an acceptable response. Acceptable responses include, but are not limited to:
- The Moon is moving away from Earth. In 700 million years, the Moon will no longer completely cover the diameter of the Sun and part of the Sun will still be seen.
  - The Moon’s apparent diameter will be smaller than the apparent diameter of the Sun, resulting in a portion of the Sun being visible.
- 34** [1] Allow 1 credit for 2.
- 35** [1] Allow 1 credit for Sample A *and* a correct explanation. Correct explanations include, but are not limited to:
- Sample A has 49.31% uranium-238 remaining, which indicates that half of the original uranium-238 has decayed since the Moon formed 4.53 billion years ago.
  - Uranium-238 has a half-life of 4.5 billion years and Sample A has approximately half of its original uranium-238 remaining, which indicates the Moon is approximately 4.5 billion years old.
- 36** [1] Allow 1 credit for 3.
- 37** [1] Allow 1 credit for 4.
- 38** [1] Allow 1 credit for an acceptable response. Acceptable responses include, but are not limited to:
- Prior to the dam’s construction, more sediment would have been deposited along the coast. After construction, more sediment is trapped behind the dam, reducing coastal deposition.
  - The dam traps sediment after it is constructed and reduces how much sediment is deposited at the coast.
- 39** [1] Allow 1 credit for 1.
- 40** [1] Allow 1 credit for \$31,076.
- 41** [1] Allow 1 credit for 3.
- 42** [1] Allow 1 credit for a correct explanation. Correct explanations include, but are not limited to:
- Deep marine eurypterids (like Pterygotidae and Megalograptidae) existed for less time than fresh water eurypterids (like Mycteropidae and Hibbertopteridae).
  - Eurypterid families that evolved from deep marine to fresh water (like Stylonuridae and Drepanopteridae) were only deep marine for a short period of time before becoming shallow marine or fresh water eurypterids.

43 [1] Allow 1 credit for 2.

44 [1] Allow 1 credit for 2.

45 [1] Allow 1 credit for 4.

46 [1] Allow 1 credit for an acceptable response. Acceptable responses include, but are not limited to:

- An increase in CO<sub>2</sub> caused less energy to flow out of the atmosphere which raised temperatures by almost 1°C, warming the climate.
- More atmospheric CO<sub>2</sub> caused less energy to flow out of the atmosphere which raised the average air temperature, raising global air surface temperatures.

**Note:** Student responses must describe the flow of energy out of the atmosphere due to changes in CO<sub>2</sub> concentrations.

47 [1] Allow 1 credit for 1.

48 [1] Allow 1 credit for *both* correct responses. Acceptable responses include, but are not limited to:

Atmospheric CO<sub>2</sub> entering ocean: increase

Ocean carbonate ions: decrease

49 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- As the availability of carbonate ions decreases, the size/health of marine calcifiers decreases.
- Marine calcifiers/corals will not have enough carbonate ions in the oceans to make their shells.
- With less carbonate ions, marine organisms that need carbonate ions will have a harder time surviving because they need carbonate ions to make their shells.

50 [1] Allow 1 credit for 2.

**The *Chart for Determining the Final Examination Score for the August 2025 Regents Examination in Earth and Space Sciences* will be posted on the Department’s web site at: <https://www.nysed.gov/state-assessment/high-school-regents-examinations> no later than August 20, 2025. Conversion charts provided for previous administrations of the Regents Examination in Earth and Space Sciences must NOT be used to determine students’ final scores for this administration.**

### **Online Submission of Teacher Evaluations of the Test to the Department**

Suggestions and feedback from teachers provide an important contribution to the test development process. The Department provides an online evaluation form for State assessments. It contains spaces for teachers to respond to several specific questions and to make suggestions. Instructions for completing the evaluation form are as follows:

1. Go to <https://www.nysed.gov/state-assessment/teacher-feedback-state-assessments>.
2. Click Regents Examinations.
3. Complete the required demographic fields.
4. Select the test title from the Regents Examination dropdown list.
5. Complete each evaluation question and provide comments in the space provided.
6. Click the SUBMIT button at the bottom of the page to submit the completed form.

**THE STATE EDUCATION DEPARTMENT**  
**THE UNIVERSITY OF THE STATE OF NEW YORK / ALBANY, NY 12234**  
 August 2025 Earth and Space Sciences Test Item Map to the Standards

Question	Type	Points	Performance Expectation
1	Constructed Response	1	HS-ESS1-1
2	Multiple Choice	1	HS-ESS1-1
3	Constructed Response	1	HS-ESS1-1
4	Multiple Choice	1	HS-ESS1-1
5	Multiple Choice	1	HS-ESS1-3
6	Constructed Response	1	HS-ESS2-5
7	Multiple Choice	1	HS-ESS2-5
8	Multiple Choice	1	HS-ESS3-4
9	Constructed Response	1	HS-ESS2-2
10	Multiple Choice	1	HS-ESS3-2
11	Multiple Choice	1	HS-ESS1-2
12	Constructed Response	1	HS-ESS1-2
13	Multiple Choice	1	HS-ESS1-2
14	Constructed Response	1	HS-ESS1-4
15	Multiple Choice	1	HS-ESS1-4
16	Multiple Choice	1	HS-ESS2-8
17	Multiple Choice	1	HS-ESS2-8
18	Constructed Response	1	HS-ESS2-8
19	Multiple Choice	1	HS-ESS2-8
20	Constructed Response	1	HS-ESS2-8
21	Multiple Choice	1	HS-ESS1-6
22	Multiple Choice	1	HS-ESS2-7
23	Constructed Response	1	HS-ESS2-7
24	Constructed Response	1	HS-ESS2-2
25	Multiple Choice	1	HS-ESS2-5
26	Constructed Response	1	HS-ESS3-1
27	Constructed Response	1	HS-ESS2-3
28	Multiple Choice	1	HS-ESS2-1
29	Multiple Choice	1	HS-ESS2-3
30	Multiple Choice	1	HS-ESS2-1
31	Multiple Choice	1	HS-ESS1-7
32	Constructed Response	1	HS-ESS1-4
33	Constructed Response	1	HS-ESS1-7
34	Multiple Choice	1	HS-ESS1-4
35	Constructed Response	1	HS-ESS1-6
36	Multiple Choice	1	HS-ESS3-2
37	Multiple Choice	1	HS-ESS3-6
38	Constructed Response	1	HS-ESS2-2
39	Multiple Choice	1	HS-ESS3-1
40	Constructed Response	1	HS-ETS1-1
41	Multiple Choice	1	HS-ESS1-6
42	Constructed Response	1	HS-ESS2-1
43	Multiple Choice	1	HS-ESS1-6
44	Multiple Choice	1	HS-ESS2-1
45	Multiple Choice	1	HS-ESS1-6
46	Constructed Response	1	HS-ESS2-4
47	Multiple Choice	1	HS-ESS3-6
48	Constructed Response	1	HS-ESS3-6
49	Constructed Response	1	HS-ESS3-6
50	Multiple Choice	1	HS-ESS3-4