

FOR TEACHERS ONLY

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

EARTH AND SPACE SCIENCES

Tuesday, June 10, 2025 — 1:15 to 4:15 p.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.

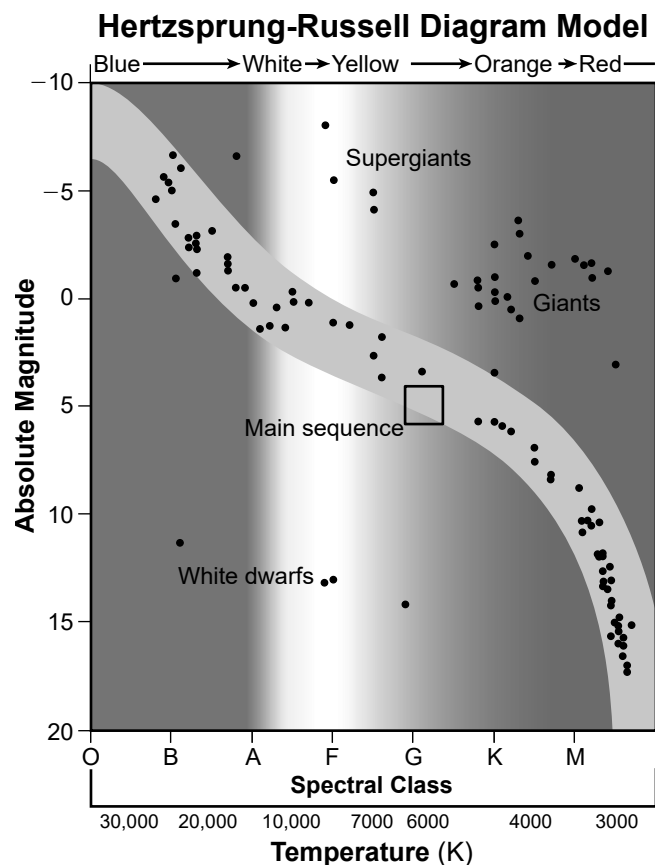
For hand scoring, raters should enter the scores earned in the appropriate boxes printed on the separate answer sheet. Next, the rater should add these scores and enter the total in the space provided. Then the student's raw score on the test should be converted to a scale score by using the conversion 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 June 26, 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.

- 1 [1] Allow 1 credit for placing the center of an **X** within the box shown below *and* a correct relative temperature and relative absolute magnitude.

Example of a 1-credit response:



Acceptable responses include, but are not limited to:

Changes in relative temperature:

- cooler
- lower temperature

Changes in relative absolute magnitude:

- decreased
- lower magnitude value

Note: It is recommended that an overlay of the same scale as a student answer sheet be used to ensure reliability in rating.

- 2 [1] Allow 1 credit for 4.

- 3 [1] Allow 1 credit for indicating *two* statements with a check mark (✓), as shown below:

☐

Venus orbits the Sun at a constant speed.

☒

Mercury travels faster in its orbit when it is closer to the Sun.

☒

Venus's orbit is less elliptical than Mercury's orbit.

☐

The orbital speeds of both planets are affected by their masses.

☐

Unlike Venus, the eccentricity of Mercury's orbit prevents Mercury from having a moon.

- 4 [1] Allow 1 credit for 2.

- 5 [1] Allow 1 credit for all *three* correct responses, as shown below:

Choice A: inside

Choice B: closer to

Choice C: Sun

- 6 [1] Allow 1 credit for 3.

- 7 [1] Allow 1 credit for 2.

- 8 [1] Allow 1 credit for 1.

- 9 [1] Allow 1 credit for 4.

- 10 [1] Allow 1 credit for *both* a correct CO₂ equivalent and a global surface temperature change.

Projected CO₂ equivalent in 2100: any value from 795 to 805.

Projected global surface temperature change: any value that would round to 2.4.

11 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- Trees are growing, so they take in carbon dioxide during photosynthesis, which stores carbon in trees and soil, preventing it from entering the atmosphere as CO₂.
- Trees that are being replanted in a forest will take in carbon dioxide from the atmosphere during photosynthesis and reduce the amount that is in the atmosphere.

12 [1] Allow 1 credit for 4.

13 [1] Allow 1 credit for 1.

14 [1] Allow 1 credit for 3.

15 [1] Allow 1 credit for any value from -10°C to 12°C *and* a correct associated impact. Acceptable impacts include, but are not limited to:

- glaciers will melt, causing sea levels to rise
- ocean circulation will be disrupted

Note: If a student indicates a negative temperature change (cooling), the associated impact must reflect this change.

16 [1] Allow 1 credit for mass.

17 [1] Allow 1 credit for 3.

18 [1] Allow 1 credit for all *three* check marks, as shown below:



A decrease in the number of sunspots is inferred to decrease Earth's temperatures.



The number of sunspots changes each year, occurring in approximately 11-year cycles.



An increase in solar output is associated with a decrease in the number of sunspots.



The average number of sunspots appearing each year has decreased steadily since 1950.



Sunspots are regions of cooler temperatures on the surface of the Sun.

- 19** [1] Allow 1 credit for 1.
- 20** [1] Allow 1 credit for 2.
- 21** [1] Allow 1 credit for an acceptable response. Acceptable responses include, but are not limited to:
- The salt front would move closer to the Atlantic Ocean because there is more fresh water from the rain event entering the river.
 - The increased rain would add more fresh water to the Hudson River, moving the salt front closer to the Atlantic Ocean.
- 22** [1] Allow 1 credit for 2.
- 23** [1] Allow 1 credit for 3.
- 24** [1] Allow 1 credit for 2.
- 25** [1] Allow 1 credit for an acceptable response. Acceptable responses include, but are not limited to:
- PCB levels in fish did decrease, but not to the EPA target levels.
 - PCB levels in fish stabilized at around 0.7 mg/kg and then increased in 2021, showing it's not effective.
 - The PCB levels as of 2021 in fish have not met the EPA targets for 2020.
- 26** [1] Allow 1 credit for 4.
- 27** [1] Allow 1 credit for 2.
- 28** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Based on the graph, the age of the meteorite is 4.5 billion years old, so Earth must also be almost 4.5 billion years old since they formed at about the same time.
 - 50% of Uranium-238 is remaining, which indicates the sample is 4.5 billion years old, so Earth must be almost the same age.
 - The age of Earth must be about 4.5 billion years old because the age of the meteorite is 4.5 billion years old since they both formed at about the same time.

29 [1] Allow 1 credit for 1.

30 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- Microorganisms (protists/eukaryotes) in the ocean produced oxygen through the process of photosynthesis that then entered the atmosphere, causing increased weathering rates and allowing for the evolution of animal life.
- Photosynthetic life in the ocean caused oxygen concentrations to increase in the ocean and then be released into the atmosphere, which allowed for greater diversity of ocean and land organisms.

Note: Responses must include the release of oxygen from the ocean by photosynthetic ocean organisms to the atmosphere.

31 [1] Allow 1 credit for Battery Electric Vehicle *and* appropriate evidence. Acceptable responses include, but are not limited to:

- Carbon dioxide is a pollutant, and the total emissions for an electric vehicle are 41 tCO_{2e} compared to 48 tCO_{2e} for the hybrid and 57 tCO_{2e} for the internal combustion engine.
- Carbon dioxide is a greenhouse gas, and the total emissions for electric vehicles are 16 tCO_{2e} less than that of internal combustion engine vehicles and 7 less than hybrid electric vehicles.

32 [1] Allow 1 credit for both an economic benefit *and* an example of how the wants and needs of society are affected by it. Acceptable responses include, but are not limited to:

Economic benefit:

- Class 1 and class 7 drivers that drive during off-peak hours with a Green Pass will save \$3.50.
- Class 1 and class 7 vehicles will pay less in tolls for off-peak hours.

Wants and needs of society:

- Class 1 and class 7 vehicles driven during off-peak hours with a Green Pass will emit less air pollution.
- People who drive internal combustion vehicles will contribute more air pollution when driving during off-peak hours, so they will have to pay more money to drive in New York City.

33 [1] Allow 1 credit for 4.

34 [1] Allow 1 credit for 3.

35 [1] Allow 1 credit for 2.

36 [1] Allow 1 credit for 3.

37 [1] Allow 1 credit for identifying either fresh water/drinking water *or* wood/timber as a natural resource and an acceptable explanation. Acceptable responses include, but are not limited to:

Effect on human activity (fresh water):

- Salt water will intrude into the freshwater well, which would negatively impact the quality of drinking water and cause the resident to move their well.
- Residents in the house would experience saltwater contamination to the drinking water supply, causing the residents to possibly relocate their home.
- They will have to get a filter or fresh water by other means.

Effect on human activity (wood):

- The salt water intrusion would kill the trees in the freshwater forested wetland over time, which would reduce the supply of available lumber for building and heating.
- As the salt water invades the tree roots, the trees will slowly die, negatively impacting the lumber industry.

38 [1] Allow 1 credit for 2.

39 [1] Allow 1 credit for *both* temporal scale responses. Acceptable responses include, but are not limited to:

Temporal scale of land subsidence associated with earthquakes:

- happens over seconds/minutes/hours
- happens in less than one day

Temporal scale of land subsidence associated with the development of ghost forests:

- happens over years/decades/centuries
- occurs over much longer periods of time than earthquake sinking

40 [1] Allow 1 credit for 4.

41 [1] Allow 1 credit for 1.

42 [1] Allow 1 credit for 1.

43 [1] Allow 1 credit for 4.

44 [1] Allow 1 credit for *both* a description of a problem and a benefit. Acceptable responses include, but are not limited to:

Problem:

- Humans have changed the habitat by allowing thornbush populations to increase, which inhibits cheetahs from finding adequate food.
- Removal of mature trees by humans has caused thornbush to grow, which inhibits cheetah hunting.

Benefit:

- Bushbloom production will benefit the cheetah by removing thornbush overgrowth so hunting behavior of cheetahs can occur.
- Thornbush plants are removed by humans, benefitting the cheetah by improving the habitat to allow for hunting.

45 [1] Allow 1 credit for 3.

46 [1] Allow 1 credit for 2.

47 [1] Allow 1 credit for an acceptable evidence. Acceptable responses include, but are not limited to:

Pattern of ages:

- The islands get older to the northwest.
- The islands get younger to the southeast.
- Islands get older with increasing distance from the hotspot.

Compass direction of movement:

- The Pacific Plate moves to the northwest.
- The Pacific Plate moves from the southeast to the northwest.

48 [1] Allow 1 credit for 3.

49 [1] Allow 1 credit for 3.

50 [1] Allow 1 credit for erosion *or* sea level rise *and* an acceptable response. Acceptable responses include, but are not limited to:

- Sandbags are beneficial because the waves will hit the sandbags and keep the coastline in place.
- Sandbags are beneficial because as water rises, the sandbags will prevent flooding from higher waves.
- The wall/rocks are a barrier to waves washing away the sediment under the highway.
- The wall/rocks will prevent water from flooding the road as water levels rise.

The *Chart for Determining the Final Examination Score for the June 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 June 26, 2025.

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
June 2025 Earth and Space Sciences Test 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-ESS1-4
4	Multiple Choice	1	HS-ESS1-4
5	Constructed Response	1	HS-ESS1-7
6	Multiple Choice	1	HS-ESS2-4
7	Multiple Choice	1	HS-ESS2-4
8	Multiple Choice	1	HS-ESS3-5
9	Multiple Choice	1	HS-ESS2-2
10	Constructed Response	1	HS-ESS3-5
11	Constructed Response	1	HS-ESS2-2
12	Multiple Choice	1	HS-ESS2-6
13	Multiple Choice	1	HS-ESS3-1
14	Multiple Choice	1	HS-ESS2-2
15	Constructed Response	1	HS-ESS3-5
16	Constructed Response	1	HS-ESS1-1
17	Multiple Choice	1	HS-ESS1-3
18	Constructed Response	1	HS-ESS1-1
19	Multiple Choice	1	HS-ESS1-2
20	Multiple Choice	1	HS-ESS1-2
21	Constructed Response	1	HS-ESS2-5
22	Multiple Choice	1	HS-ESS2-2
23	Multiple Choice	1	HS-ESS3-1
24	Multiple Choice	1	HS-ESS3-4
25	Constructed Response	1	HS-ESS2-2
26	Multiple Choice	1	HS-ESS1-6
27	Multiple Choice	1	HS-ESS1-4
28	Constructed Response	1	HS-ESS1-6
29	Multiple Choice	1	HS-ESS2-1
30	Constructed Response	1	HS-ESS2-7
31	Constructed Response	1	HS-ESS3-2
32	Constructed Response	1	HS-ETS1-1
33	Multiple Choice	1	HS-ESS3-2
34	Multiple Choice	1	HS-ESS3-6
35	Multiple Choice	1	HS-ESS3-3
36	Multiple Choice	1	HS-ESS2-2
37	Constructed Response	1	HS-ESS3-1
38	Multiple Choice	1	HS-ESS3-5
39	Constructed Response	1	HS-ESS2-1
40	Multiple Choice	1	HS-ETS1-3
41	Multiple Choice	1	HS-ESS3-3
42	Multiple Choice	1	HS-ESS3-3
43	Multiple Choice	1	HS-ESS2-2
44	Constructed Response	1	HS-ESS3-4
45	Multiple Choice	1	HS-ETS1-2
46	Multiple Choice	1	HS-ESS2-1
47	Constructed Response	1	HS-ESS1-5
48	Multiple Choice	1	HS-ESS1-5
49	Multiple Choice	1	HS-ESS2-1
50	Constructed Response	1	HS-ESS3-4

* This item map 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).