

# FOR TEACHERS ONLY

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

## PHYSICAL SETTING/EARTH SCIENCE

Thursday, August 17, 2023 — 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 Physical Setting/Earth Science. 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 Part B–2 and Part C 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. The student’s score for the Earth Science Performance Test should be recorded in the space provided. Then the student’s raw scores on the written test and the performance 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> on Thursday, August 17, 2023. 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.

## Part B–2

**Allow a maximum of 15 credits for this part.**

To ensure the accuracy of overlays, select a printer setting such as *full*, *actual size*, or *100%* when printing this document. Do **not** select the *fit to page* setting.

**51** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- Shale weathers too easily.
- Shale may split easily.
- Shale will break down too quickly.

**52** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- banding
- minerals segregated into bands
- foliation
- contains pyroxene and/or garnet crystals

**53** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- quartz
- potassium feldspar (orthoclase)
- plagioclase feldspar
- feldspar

**54** [1] Allow 1 credit for any value from 8.5 to 8.8 ly.

**Note:** Allow credit if a student indicates a fraction, such as  $8\frac{2}{3}$ .

**55** [1] Allow 1 credit for Barnard's Star.

**56** [1] Allow 1 credit for circling *both* greater luminosity and greater mass.

**57** [1] Allow 1 credit for the Milky Way Galaxy.

**58** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- fusion
- nuclear fusion
- combining lighter elements into heavier elements
- combining hydrogen into helium

59 [1] Allow 1 credit if *both* responses include the correct numerical value and unit. Acceptable responses include, but are not limited to:

**Note:** Allow credit for any value from 20.7 miles/hour to 25.3 miles/hour for the anemometer.

Allow credit for “0.31 inches in past 6 hours” for a precipitation gauge unit.

**Albany, New York Weather Data**

Weather Instrument	Numerical Value with Units
anemometer	Any value from 18 knots to 22 knots
precipitation gauge	.31 inches <i>or</i> 0.31 in <i>or</i> $\frac{31}{100}$ in

60 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

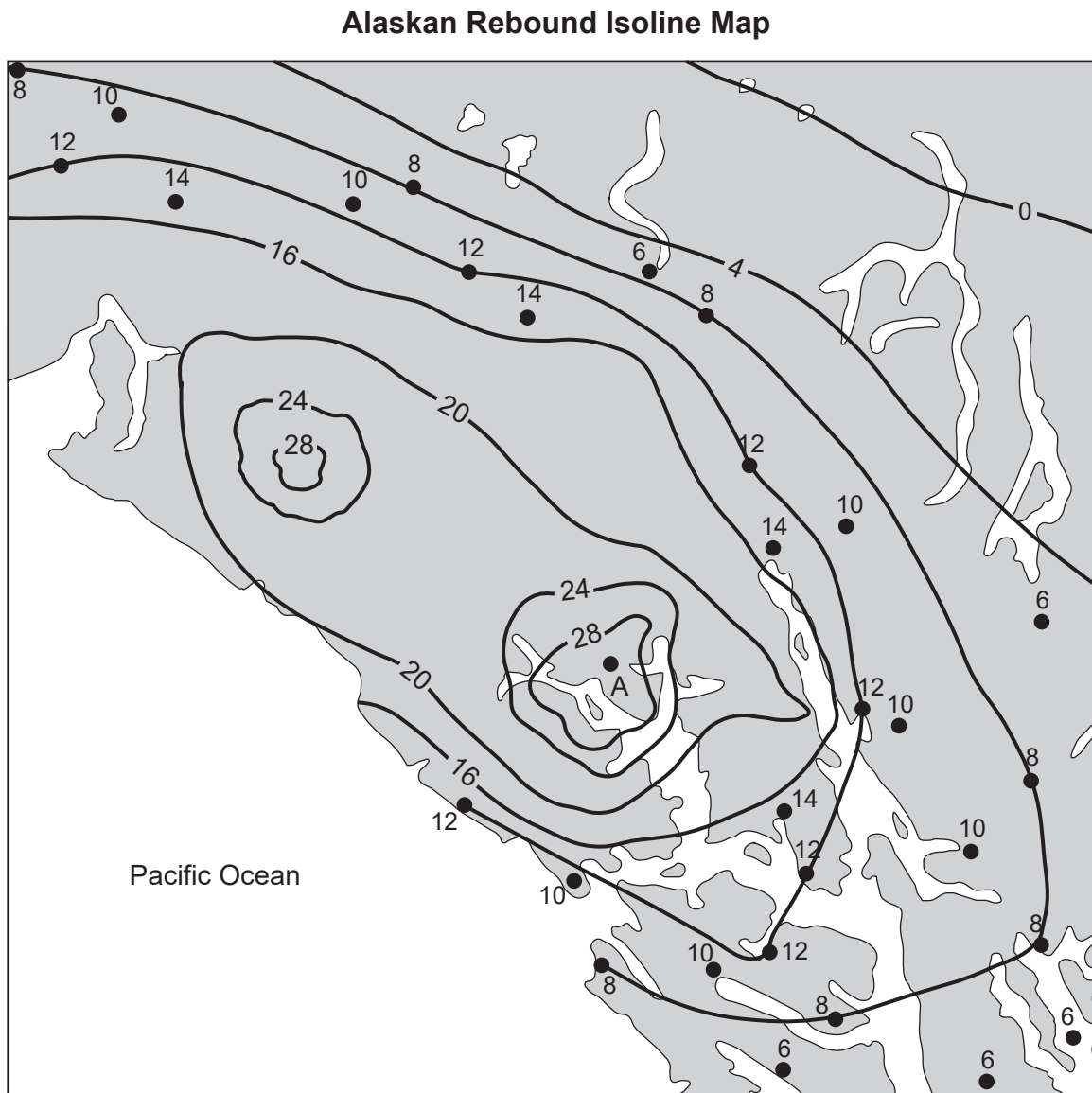
- The air temperature and dewpoint were close in value.
- There is only a 2 F° difference between air temperature and dewpoint.
- A rain shower/rain was occurring.
- Cloud cover was 100%.
- There is low pressure in Albany at this time. / The pressure in Albany has dropped during the past 3 hours.
- low visibility

61 [1] Allow 1 credit if *both* the 8 mm/y and 12 mm/y isolines are correctly drawn with each end drawn to the edge of the map or edge of the land area.

**Note:** Do *not* allow credit if student-drawn isolines do *not* pass through or touch all 8 and 12 data points.

If additional isolines are drawn, *all* isolines must be correct to receive credit. The isolines need not be continued over the Pacific Ocean.

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



62 [1] Allow 1 credit for any value greater than 28 mm/y but less than 32 mm/y.

63 [1] Allow 1 credit for asthenosphere.

**64** [1] Allow 1 credit for *both* Pacific Plate and North American Plate.

**65** [1] Allow 1 credit for *two* correct responses. Acceptable responses include, but are not limited to:

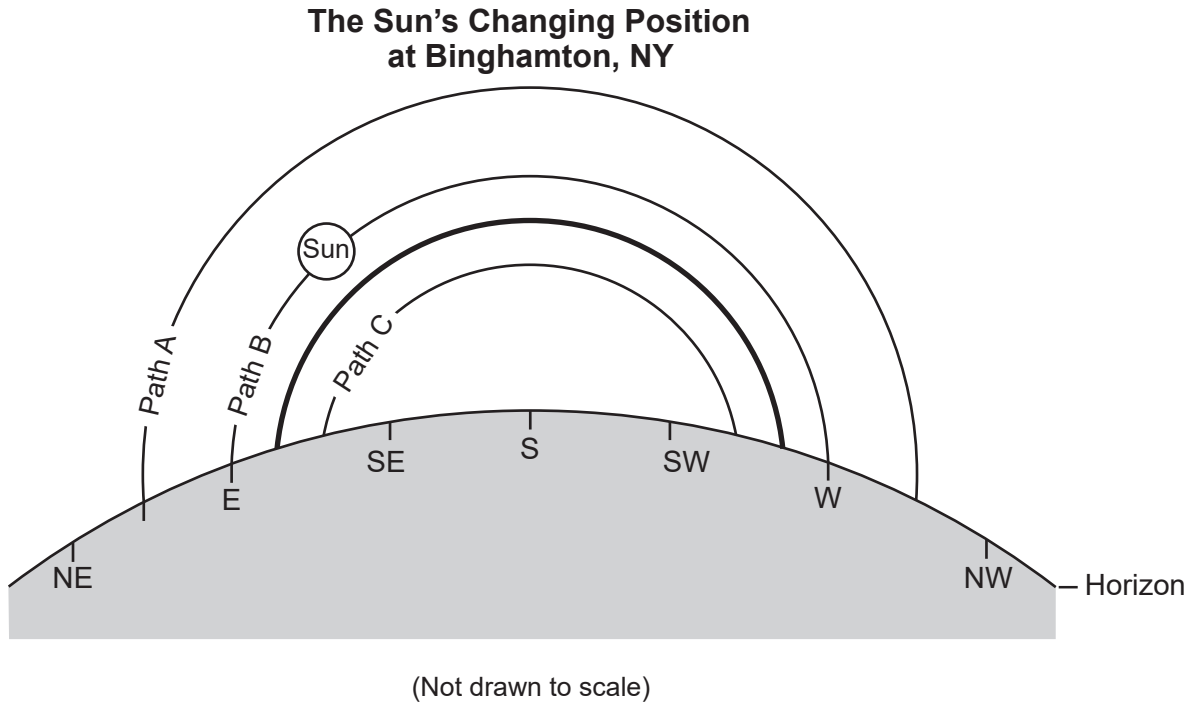
- carbon dioxide *or*  $\text{CO}_2$
- methane *or*  $\text{CH}_4$
- water vapor *or*  $\text{H}_2\text{O}$
- nitrous oxide *or*  $\text{N}_2\text{O}$
- ozone *or*  $\text{O}_3$
- chlorofluorocarbons *or* CFCs

## Part C

Allow a maximum of 20 credits for this part.

- 66 [1] Allow 1 credit if the line is located between path B and path C as shown below. The line representing the Sun's path must extend to the horizon line.

Example of a 1-credit response:



- 67 [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- The length of the shadow will get shorter until solar noon, then longer until sunset.
  - decreases then increases
  - starts long, gets short, then long again

- 68 [1] Allow 1 credit for any value from 8 a.m. to 10 a.m.

**Note:** Allow credit for a response that indicates “a.m.”, such as 9 in the morning *or* 0900.

- 69 [1] Allow 1 credit for circling *both* less intensity and shorter duration.

70 [1] Allow 1 credit for Silurian Period.

71 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- widespread geographic distribution
- existed for a short period of geologic time
- easily distinguishable/recognizable

72 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- A marine environment existed.
- There was an inland sea.
- warm shallow sea
- Part of New York State was underwater.

73 [1] Allow 1 credit for *both* circling felsic and listing two correct minerals. Acceptable responses include, but are not limited to:

- potassium feldspar/orthoclase
- quartz
- plagioclase/plagioclase feldspar
- biotite/biotite mica
- amphibole/hornblende

**Note:** Allow credit for “feldspar” alone if it is paired only with quartz, biotite/biotite mica *or* amphibole/hornblende.

74 [1] Allow 1 credit for Allegheny Plateau *or* the Catskills *or* Appalachian Plateau (Uplands) *or* Hudson-Mohawk Lowlands *or* Erie-Ontario Lowlands *or* Hudson Highlands.

75 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- weathering and/or erosion
- The mountain was weathered and eroded by ice and running water.
- Glaciers wore away rock materials.

**Note:** Do *not* allow credit for the name of an erosional agent along, such as “glaciers” or “running water,” without an explanation of how these erosional agents reduce the mountain size.



76 [1] Allow 1 credit for *both* B and F.

77 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- H is near a tectonic plate boundary.
- A is farther away from a plate boundary.
- Earthquakes are more frequent at plate boundaries.

78 [1] Allow 1 credit for any value from 2800 km to 2999 km.

79 [1] Allow 1 credit if *both* responses are acceptable. Acceptable responses include, but are not limited to:

Rock name:

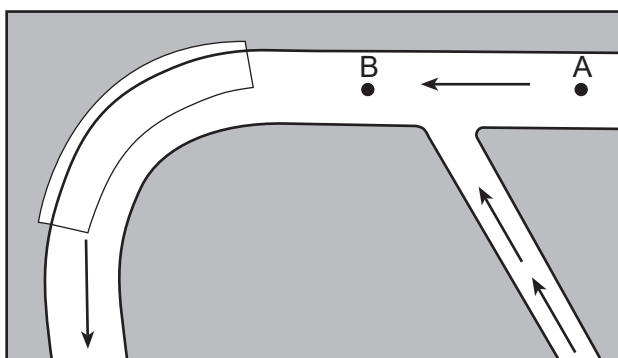
- Basalt/basaltic

Rock density:

- $3.0 \text{ g/cm}^3$
- $3 \text{ g/cm}^3$

80 [1] Allow 1 credit if the center of an **X** is within or touches the clear region shown below.

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



(Not drawn to scale)

81 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- The discharge volume of water at location B is greater with the additional water from the tributary.
- The volume of water is greater at B.
- The slope at location B could be steeper so the water flows faster.

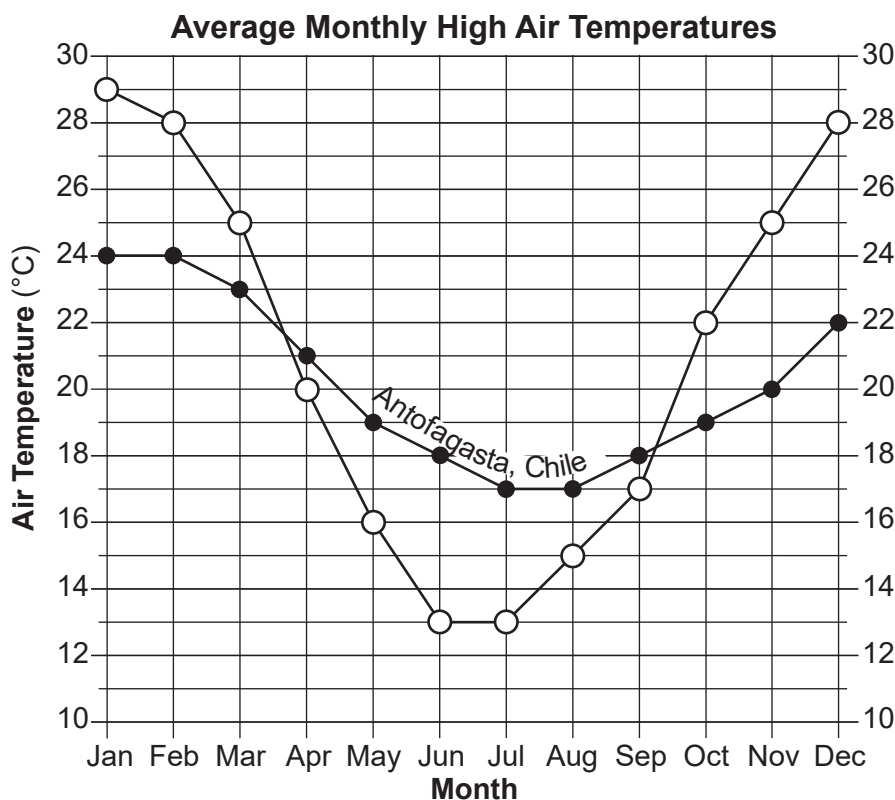
82 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- The pebble will become rounder.
- The pebble will decrease in size and mass.
- The pebble will become smoother.
- The pebble will become smaller.

83 [1] Allow 1 credit if the centers of *all twelve* student plots are within or touch the circles shown and are correctly connected with a line that passes within or touches each circle.

**Note:** Allow credit if the student line does not pass through the student plots but is still within or touches the circles.

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



84 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- Antofagasta is located near a large body of water/ocean.
- La Junta is located in the interior of the continent.
- Large bodies of water moderate air temperatures.
- Antofagasta is a coastal location.
- La Junta's climate is not moderated by a large body of water.
- Water has a high specific heat and changes temperatures more slowly, and Antofagasta is closer to a large body of water.

**85** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- Earth’s southern axis is tilted toward the Sun in December, January, and February, producing warmer temperatures.
- In the Southern Hemisphere, summer occurs in December, January, and February, and winter occurs in June, July, and August.
- The intensity and duration of insolation is greatest in December, January, and February at these locations.
- Both cities are located in the Southern Hemisphere.

**Note:** Do *not* allow credit for “the cities are located in South America” or “South America is located below the equator” because parts of South America are located above the equator.

Do *not* allow credit for “the Southern Hemisphere faces the Sun” because part of the Northern Hemisphere also faces the Sun during daylight hours.

Do *not* allow credit for “Earth is tilted toward the Sun” because only the Southern Hemisphere is tilted toward the Sun.

## Regents Examination in Physical Setting/Earth Science

August 2023

### Chart for Converting Total Test Raw Scores to Final Examination Scores (Scale Scores)

**The *Chart for Determining the Final Examination Score for the August 2023 Regents Examination in Physical Setting/Earth Science* will be posted on the Department's web site at: <https://www.nysed.gov/state-assessment/high-school-regents-examinations> on Thursday, August 17, 2023. Conversion charts provided for previous administrations of the Regents Examination in Physical Setting/Earth Science 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. Select the test title.
3. Complete the required demographic fields.
4. Complete each evaluation question and provide comments in the space provided.
5. Click the SUBMIT button at the bottom of the page to submit the completed form.

## Map to Core Curriculum

<b>August 2023 Physical Setting/Earth Science</b>			
<b>Question Numbers</b>			
Key Ideas/Performance Indicators	Part A	Part B	Part C
<b>Standard 1</b>			
Math Key Idea 1			83
Math Key Idea 2	9, 22, 28	54, 55, 56	
Math Key Idea 3	10	33	80
Science Inquiry Key Idea 1	29	36, 37, 45, 49, 58	71, 75, 77, 81, 84, 85
Science Inquiry Key Idea 2			
Science Inquiry Key Idea 3	5, 7, 10, 15, 16, 17, 18, 19, 21, 23, 25, 26, 27, 32	39, 40, 43, 45, 46, 50, 51, 52, 53, 56, 59, 60, 63, 64	67, 70, 72, 73, 74, 76, 78, 79
Engineering Design Key Idea 1			
<b>Standard 2</b>			
Key Idea 1			
Key Idea 2			
Key Idea 3			
<b>Standard 6</b>			
Key Idea 1		57	80
Key Idea 2	2, 6, 8, 10, 12, 14, 15, 16, 17, 29, 30, 31, 32, 33, 34, 35	38, 41, 42, 44, 47, 48, 54, 55, 59, 60, 61, 62, 63, 64	66, 67, 68, 70, 72, 77, 78, 81
Key Idea 3		62	
Key Idea 4			
Key Idea 5	8	41, 47, 61, 65	66, 67, 68, 69, 75, 78, 82, 84
Key Idea 6			
<b>Standard 7</b>			
Key Idea 1			
Key Idea 2			
<b>Standard 4</b>			
Key Idea 1	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 21, 22, 23, 29	38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 54, 55, 56, 57, 58	66, 67, 68, 70, 71, 74
Key Idea 2	13, 14, 15, 16, 17, 18, 19, 20, 24, 28, 30, 31, 32, 33, 34, 35	36, 37, 48, 49, 50, 59, 60, 61, 62, 63, 64, 65	69, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85
Key Idea 3	25, 26, 27	51, 52, 53	73
<b>Reference Tables</b>			
ESRT 2011 Edition (Revised)	5, 7, 10, 15, 16, 17, 18, 19, 21, 23, 25, 26, 27, 32	39, 40, 43, 45, 46, 50, 52, 53, 56, 59, 60, 63, 64	70, 72, 73, 74, 76, 78, 79