

# FOR TEACHERS ONLY

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

## PHYSICAL SETTING/EARTH SCIENCE

Thursday, January 28, 2016 — 9:15 a.m. to 12:15 p.m., only

### SCORING KEY AND 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: <http://www.p12.nysed.gov/assessment/> 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.

**Part A and Part B-1**

Allow 1 credit for each correct response.

**Part A**

1 ..... 2 .....	10 ..... 1 .....	19 ..... 1 .....	28 ..... 2 .....
2 ..... 1 .....	11 ..... 3 .....	20 ..... 4 .....	29 ..... 1 .....
3 ..... 3 .....	12 ..... 3 .....	21 ..... 3 .....	30 ..... 1 .....
4 ..... 4 .....	13 ..... 3 .....	22 ..... 4 .....	31 ..... 3 .....
5 ..... 2 .....	14 ..... 2 .....	23 ..... 1 .....	32 ..... 1 .....
6 ..... 2 .....	15 ..... 2 .....	24 ..... 2 .....	33 ..... 1 .....
7 ..... 3 .....	16 ..... 2 .....	25 ..... 3 .....	34 ..... 1 .....
8 ..... 4 .....	17 ..... 1 .....	26 ..... 2 .....	35 ..... 4 .....
9 ..... 4 .....	18 ..... 4 .....	27 ..... 4 .....	

**Part B-1**

36 ..... 2 .....	40 ..... 1 .....	44 ..... 2 .....	48 ..... 2 .....
37 ..... 4 .....	41 ..... 3 .....	45 ..... 1 .....	49 ..... 4 .....
38 ..... 4 .....	42 ..... 1 .....	46 ..... 4 .....	50 ..... 3 .....
39 ..... 2 .....	43 ..... 2 .....	47 ..... 4 .....	

## 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*.

**Do not attempt to correct the student's work by making insertions or changes of any kind. If the student's responses for the multiple-choice questions are being hand scored prior to being scanned, the scorer must be careful not to make any marks on the answer sheet except to record the scores in the designated score boxes. Marks elsewhere on the answer sheet will interfere with the accuracy of the scanning.**

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 Scoring Key and 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. 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: <http://www.p12.nysed.gov/assessment/> on Thursday, January 28, 2016. 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.**

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

- uplift/emergence
- erosion
- submergence/subsidence
- weathering
- deposition
- burial

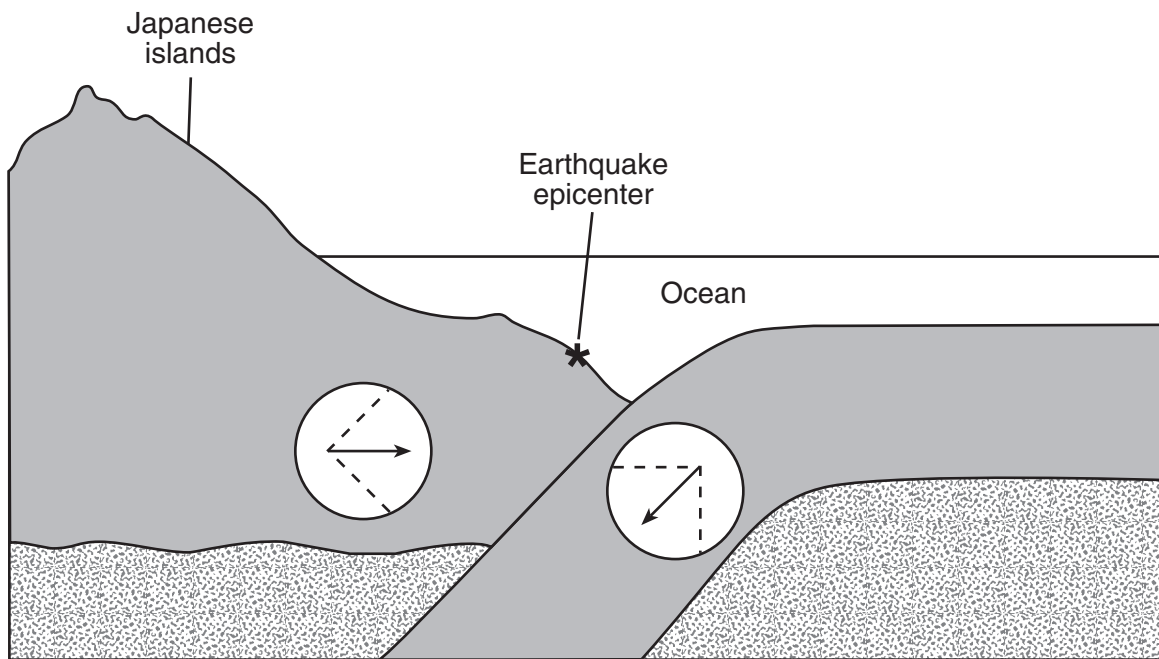
**52** [1] Allow 1 credit for *Tetragraptus*.

**53** [1] Allow 1 credit for Pacific Plate and Okhotsk Plate.

**54** [1] Allow 1 credit for *two* correctly drawn arrows, one in each circle, that indicate a converging plate boundary. Student-drawn arrows must be oriented within a range of plus or minus 45° (the region between the dotted lines) of the two arrows as shown below.

**Note:** Allow credit even if arrows are not inside the circles.

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



(Not drawn to scale)

55 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- Sound alarm for residents.
- Move to higher ground.
- Evacuate coastal areas.
- Broadcast radio/TV bulletins.
- Move ships away from the coast.
- Follow evacuation routes.

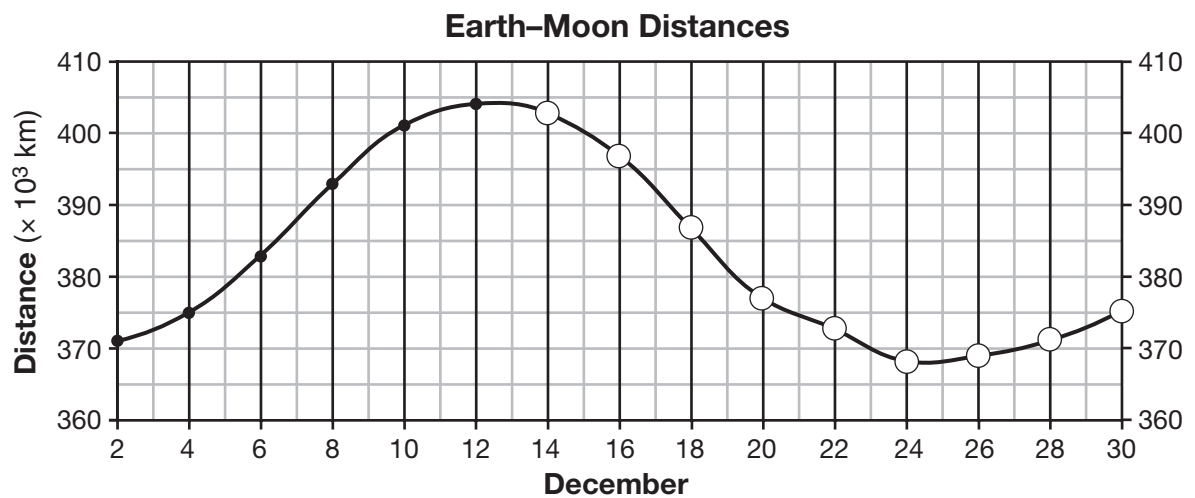
56 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- volcano/volcanic mountain
- trench/Aleutian trench
- island arc
- mountains
- fault

57 [1] Allow 1 credit if the centers of *all nine* of the student's plots are within or touch the circles shown and *all 15* plots are correctly connected with a line that passes within or touches each circle.

**Note:** Allow credit if the line misses a plot but is still within or touches the circle.

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



- 58** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- The Earth-Moon distance varies in a regular pattern.
  - The Earth-Moon distance is not constant.
  - A circular orbit would have the same distance throughout the month.
  - The Earth-Moon graph increases, then decreases.

**59** [1] Allow 1 credit for December 24, 2010.

**60** [1] Allow 1 credit for December 18, 2010, *or* December 6, 2010, *or* December 7, 2010.

**61** [1] Allow 1 credit for December 20, 2010 *or* December 21, 2010.

**62** [1] Allow 1 credit for marble *or* hornfels.

- 63** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- color/light color/dark color
  - density/low density/high density
  - mineral composition
  - rich in Al, Si, *or* rich in Fe, Mg
  - presence/absence of quartz/potassium feldspar/pyroxene/olivine

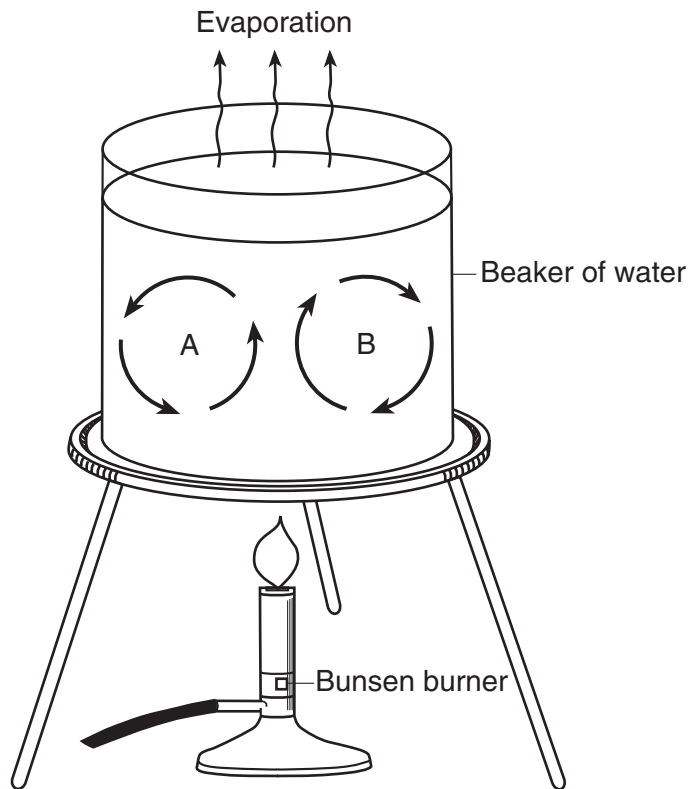
**Note:** Do *not* allow credit for “composition” alone because it is stated in the question.

- 64 [1] Allow 1 credit if *all six* arrowheads are drawn anywhere on each line to indicate the correct direction of water movement around letters A and B.

**Note:** Allow credit if the student does not use the lines given in the diagram, but draws arrows around A and B to accurately show convection within the beaker.

If more than six arrowheads are drawn, all must be correct to receive credit.

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



- 65 [1] Allow 1 credit for 2260 J/g.

**Part C**

**Allow a maximum of 20 credits for this part.**

**66** [1] Allow 1 credit for any value from 130 cm to 160 cm.

**67** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

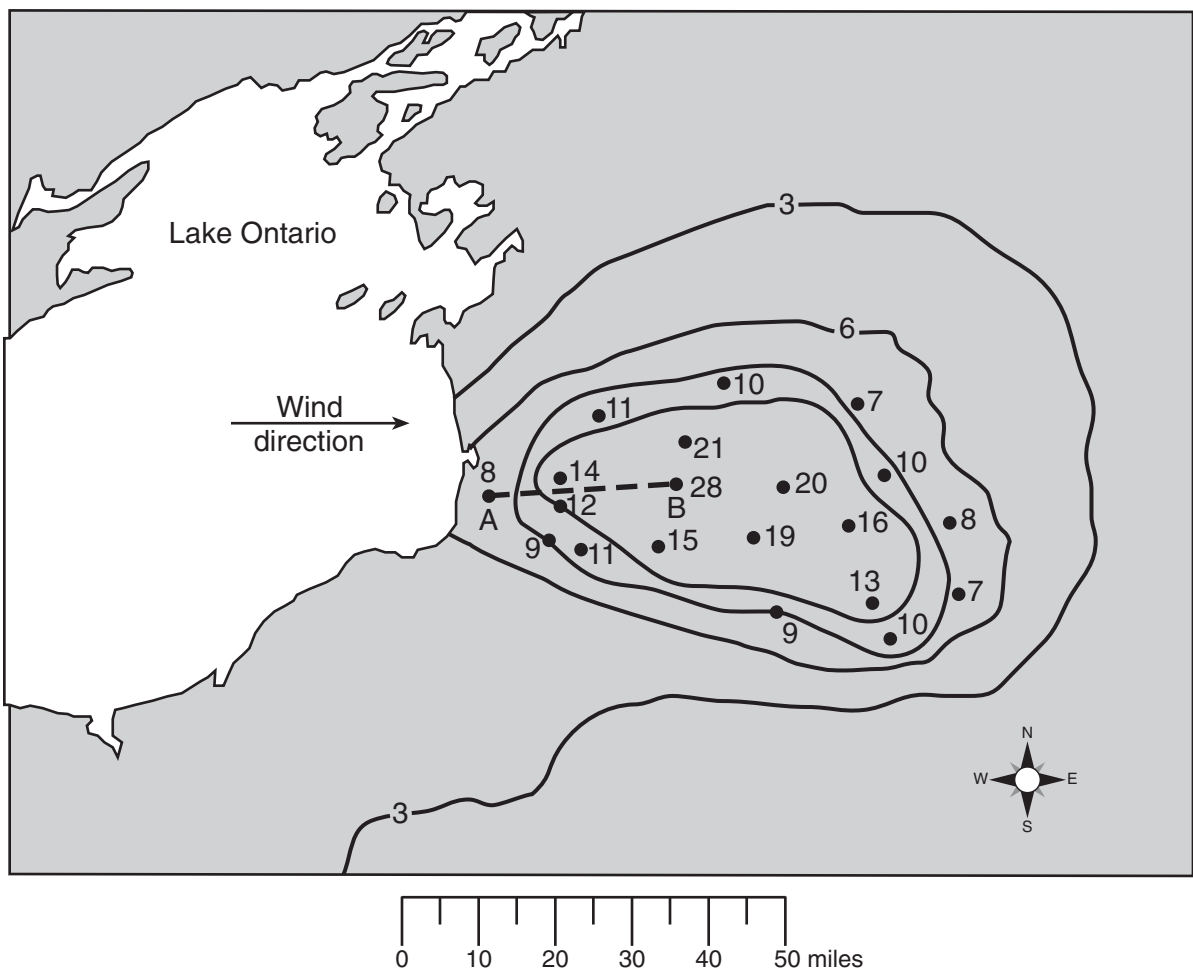
- The altitude of the Sun in the sky changes.
- Earth rotates.
- the Sun's position in the sky
- the apparent motion of the Sun

**68** [1] Allow 1 credit for north *or* N.

**69** [1] Allow 1 credit for correctly drawn 9-inch and 12-inch snow depth isolines. If additional isolines have been drawn, all isolines must be correct to receive credit.

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

**November 16–19, 2008, Storm Snow Depth (inches)**



70 [1] Allow 1 credit for any response from 0.75 in/mi to 0.85 in/mi.

**Note:** Do *not* allow credit for  $\frac{20}{25}$  because this does not show a complete calculation.

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

- Not as much moisture would have evaporated from Lake Ontario, so the snowfall depths would not have been as great.
- Less water vapor would have been picked up from the lake surface.
- An unfrozen lake surface allows for more evaporation.

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

- Location A is on the windward side of mountains.
- Location A receives prevailing winds off the ocean.
- Location A is closer to the ocean.
- Location B is on the leeward side of a mountain range.
- Adiabatic warming occurs in descending air at location B after losing most of its moisture on the windward side of a mountain/orographic effect.
- The prevailing southwest winds bring moist air to location A.

73 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- elevation
- high altitude
- mountains

74 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- higher latitude
- farther north of the equator
- lower angle of insolation
- Location E is closer to the equator.

**Note:** Do *not* allow credit for “latitude” alone because it is not specific enough.

75 [1] Allow 1 credit for any value from 0.8 cm to 1.1 cm.



**76** [1] Allow 1 credit if *both* responses are acceptable. Acceptable responses include, but are not limited to:

Changes in size:

- smaller
- decreases

Changes in shape:

- They become more rounded.
- rounder
- less angular

**Note:** Do *not* allow credit for “smoother” alone because this denotes a texture, not a shape.

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

- Sediments deposited by a river are arranged in layers/stratified layers.
- River deposits are sorted.
- sorted by size, shape, and density

**78** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- gneiss
- schist
- phyllite

**79** [1] Allow 1 credit for the minerals listed in the order shown below.

- A: feldspar
- B: quartz
- C: amphibole
- D: garnet

**80** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- Heat and pressure metamorphosed early rocks.
- Regional metamorphism distorted these rocks.
- heat and pressure
- metamorphism

**Note:** Do *not* allow credit for “contact metamorphism” because schist forms from regional metamorphism.

- 81** [1] Allow 1 credit for any value from 318 my to 359 my.
- 82** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Calcite bubbles with acid.
  - Calcite shows cleavage.
  - Quartz is harder than calcite.
  - Calcite is composed of calcium (Ca), oxygen (O), and carbon (C), and quartz is composed of silicon (Si) and oxygen (O).
- 83** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- jewelry
  - abrasives
  - gemstone
- 84** [1] Allow 1 credit for garnet *or* quartz.
- 85** [1] Allow 1 credit for *one* mineral listed below.
- talc
  - biotite mica/biotite
  - pyroxene
  - potassium feldspar/orthoclase
  - olivine

## Regents Examination in Physical Setting/Earth Science

January 2016

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

**The Chart for Determining the Final Examination Score for the January 2016 Regents Examination in Physical Setting/Earth Science will be posted on the Department's web site at: <http://www.p12.nysed.gov/assessment/> on Thursday, January 28, 2016. 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 <http://www.forms2.nysed.gov/emsc/osa/exameval/reexameval.cfm>.
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>January 2016 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	2, 12	57	70
Math Key Idea 2	28	36, 42, 43, 58, 60	66
Math Key Idea 3			
Science Inquiry Key Idea 1	1, 8, 11, 15, 16, 20, 22, 23, 33		67, 80
Science Inquiry Key Idea 2			
Science Inquiry Key Idea 3	2, 4, 5, 9, 10, 11, 12, 14, 17, 18, 19, 25, 26, 28, 30, 31, 32	36, 39, 40, 41, 42, 43, 46, 48, 52, 53, 54, 56, 60, 62, 63, 64, 65	68, 70, 72, 75, 78, 80, 81, 82, 83, 84, 85
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	27	44, 46, 49, 56	77, 79, 84, 85
Key Idea 2	3, 5, 7, 8, 16, 17, 21, 23, 25, 29, 30, 31, 32, 33, 34, 35	36, 37, 38, 39, 40, 41, 42, 45, 51, 52, 53, 54, 56, 62, 63, 64, 65	69, 70, 72, 73, 74, 78, 79, 81, 82
Key Idea 3	30		
Key Idea 4		59	
Key Idea 5	6, 14, 21, 24, 31, 32	38, 47, 54, 61	71, 76
Key Idea 6		50	
<b>Standard 7</b>			
Key Idea 1			
Key Idea 2		55	
<b>Standard 4</b>			
Key Idea 1	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 18, 21, 22, 24, 28, 29, 31	41, 42, 43, 49, 50, 51, 52, 57, 58, 59, 60, 61, 65	66, 67, 68, 71, 81
Key Idea 2	13, 14, 15, 16, 17, 19, 20, 23, 25, 26, 27, 30, 32, 33, 34, 35	36, 37, 38, 39, 40, 44, 45, 46, 47, 48, 53, 54, 55, 56, 64	69, 70, 72, 73, 74, 75, 76, 77, 79
Key Idea 3		62, 63	78, 80, 82, 83, 84, 85
<b>Reference Tables</b>			
ESRT 2011 Edition (Revised)	2, 4, 5, 11, 12, 14, 17, 18, 19, 25, 26, 28, 30, 31, 32	39, 42, 43, 48, 52, 54, 56, 60, 62, 63, 64, 65	70, 72, 75, 78, 80, 81, 82, 83, 84, 85