

FOR TEACHERS ONLY

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

P.S.–E.S. PHYSICAL SETTING/EARTH SCIENCE

Thursday, August 18, 2016 — 8:30 to 11:30 a.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 4	10 4	19 3	28 2
2 2	11 1	20 1	29 3
3 1	12 1	21 1	30 3
4 2	13 3	22 3	31 2
5 3	14 4	23 1	32 4
6 2	15 4	24 2	33 1
7 3	16 2	25 4	34 4
8 4	17 2	26 2	35 1
9 1	18 3	27 1	

Part B–1

36 2	40 1	44 4	48 3
37 3	41 4	45 1	49 3
38 1	42 3	46 3	50 4
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, August 18, 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.

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 if *each of the three* fossil names is in its correct row.

Rock Unit	Fossil Name
1	<i>Centroceras</i>
2	<i>Hexameroceras</i>
3	<i>Cryptolithus</i>

Note: Allow credit if students list the correct sequence of letters corresponding to these fossils as shown on page 8 of the *Earth Science Reference Tables*: (1) F, (2) E, (3) B.

52 [1] Allow 1 credit for limestone *or* dolostone.

53 [1] Allow 1 credit for the chemical formula $\text{CaMg}(\text{CO}_3)_2$.

54 [1] Allow 1 credit if *both* processes are correct. Acceptable responses include, but are not limited to:

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

55 [1] Allow 1 credit if *both* the longitude difference and time difference are correct.

- Longitude difference: any value from 45° to 47°
- Time difference: 3 h

56 [1] Allow 1 credit if *both* cities are correct. Acceptable responses include:

- Denver and Reno
- New York City and Omaha
- Milwaukee and Buffalo

57 [1] Allow 1 credit for New York City *or* New York *or* NYC.

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

- rotation
- Earth rotates on its axis.
- a spinning Earth

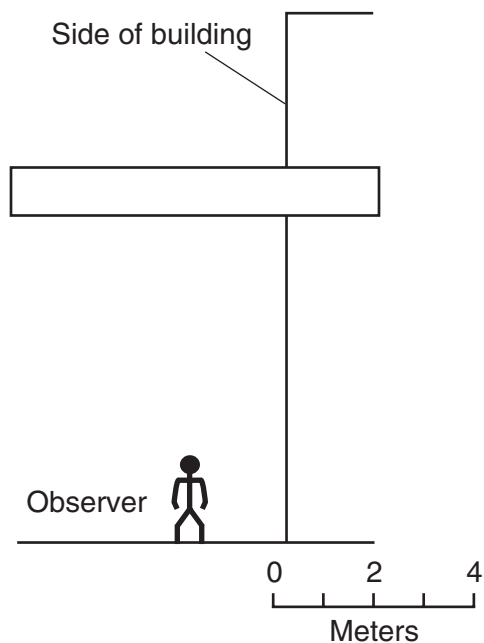
59 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- convergent plate boundary
- subduction zone
- colliding plates

60 [1] Allow 1 credit if the center of the **X** is within or touches the edge of the box below.

Note: Allow credit if a symbol other than an **X** is used.

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



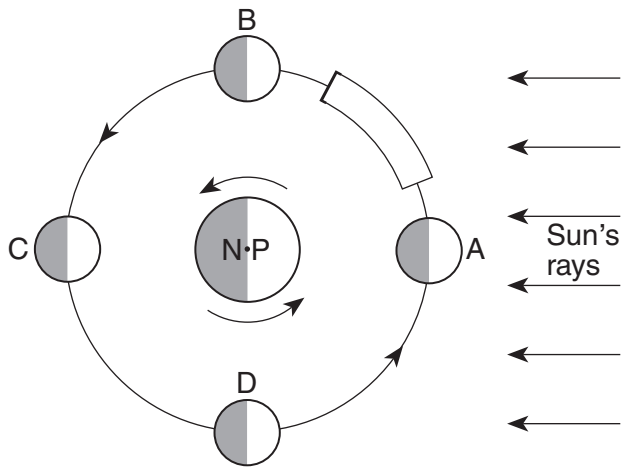
- 61** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- *P*-wave
 - primary wave/*P*
 - compressional wave
- 62** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Evacuate to higher elevations/evacuate.
 - Move to higher floors of buildings.
 - Move inland, away from the coast.
 - Move boats to deeper water.
 - Seek out emergency shelters.
- 63** [1] Allow 1 credit if *both* responses are correct.
- Air pressure: barometer
- Air temperature: thermometer
- 64** [1] Allow 1 credit if *both* dewpoint and relative humidity are correct.
- Dewpoint: 8°C
- Relative humidity: 40%
- 65** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- condensation
 - water vapor changing to liquid water
 - gas to liquid

Part C

Allow a maximum of 20 credits for this part.

- 66** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- As the Earth-to-galaxy distance increases, the recession velocity increases.
 - Galaxies closer to Earth are moving more slowly.
 - direct relationship/positive relationship
- 67** [1] Allow 1 credit for any value from 1800 to 2200 million light years.
- 68** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- fusion/nuclear fusion
 - Light elements combine to form heavier elements.
- 69** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- ^{14}N
 - nitrogen-14
 - nitrogen
- 70** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- C-14 is used to date recent organic remains.
 - The mastodont bone is less than 50,000 years old.
 - Carbon-14 has a short half-life.
 - Carbon-14 decays at a predictable rate.
- 71** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- advance and retreat of last continental ice
 - last ice age
 - glaciation
 - formation of Long Island
 - formation of New York State Finger Lakes

72 [1] Allow 1 credit if the center of the **X** is located within or touches the bracket below.



(Not drawn to scale)

Note: Allow credit if a symbol other than an **X** is used.

73 [1] Allow 1 credit for any value from 14.0 to 15.0 days.

74 [1] Allow 1 credit for *both* a correct effect on high-tide height and a correct effect on low-tide height. Acceptable responses include, but are not limited to:

Height of high tide:

- High tides will be higher.
- higher
- increase

Height of low tide:

- Low tides will be lower.
- lower
- decrease

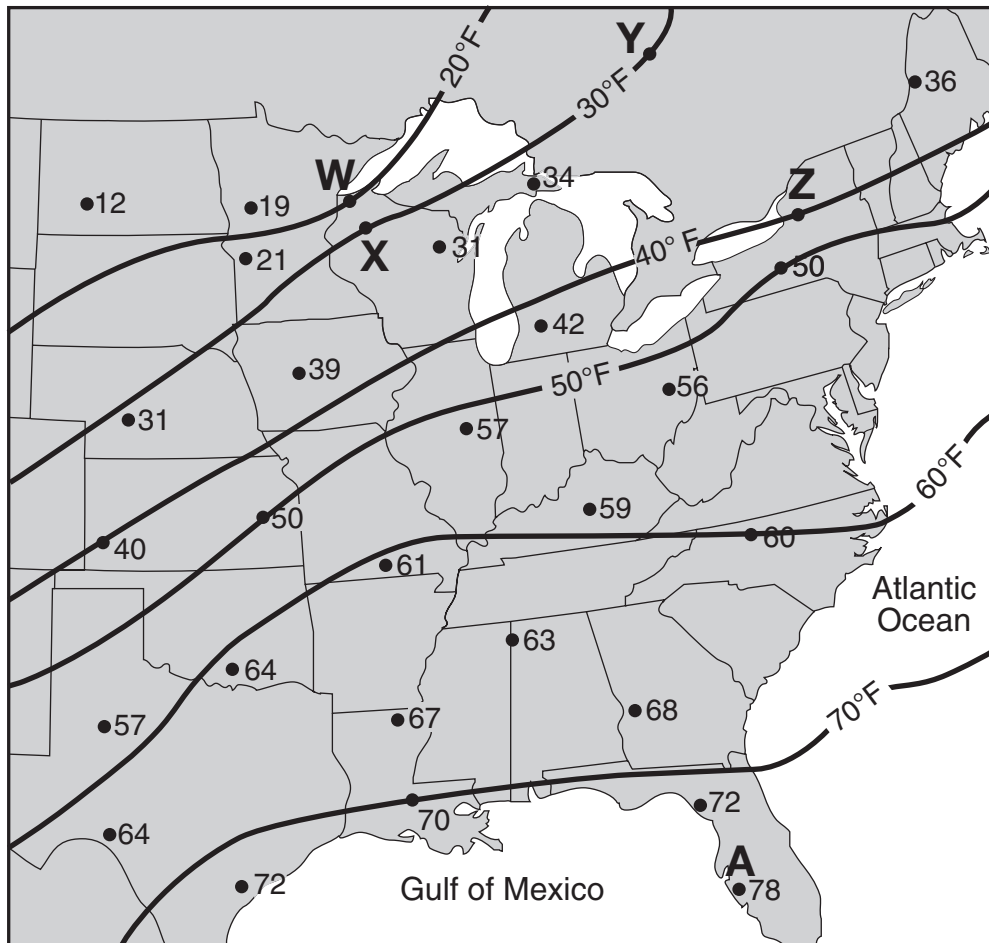
75 [1] Allow 1 credit for the Sun.

76 [1] Allow 1 credit if *both* the 50°F and 60°F isotherms are correctly drawn. If additional isotherms are drawn, all isotherms must be correct to receive credit.

Note: Allow credit if the isotherms extend only to the edge of the land area.

Do *not* allow credit if student-drawn isotherms do *not* pass through or touch the 50 and 60 data points.

Example of a 1-credit response:



77 [1] Allow 1 credit for any value from 39°F to 41°F.

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

- The isotherms are closer together between locations *W* and *X* than they are between locations *Y* and *Z*.
- Temperatures between *W* and *X* show the same change over a shorter distance.
- The isotherms are farther apart between *Y* and *Z*.
- The isolines are closer together.

79 [1] Allow 1 credit for density *or* high density *or* 19.3 g/cm³.

80 [1] Allow 1 credit for a value from 1.5 to 2.5 cm.

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

Water velocity:

- increases
- speeds up
- gets greater
- flows faster

Amount of sediment:

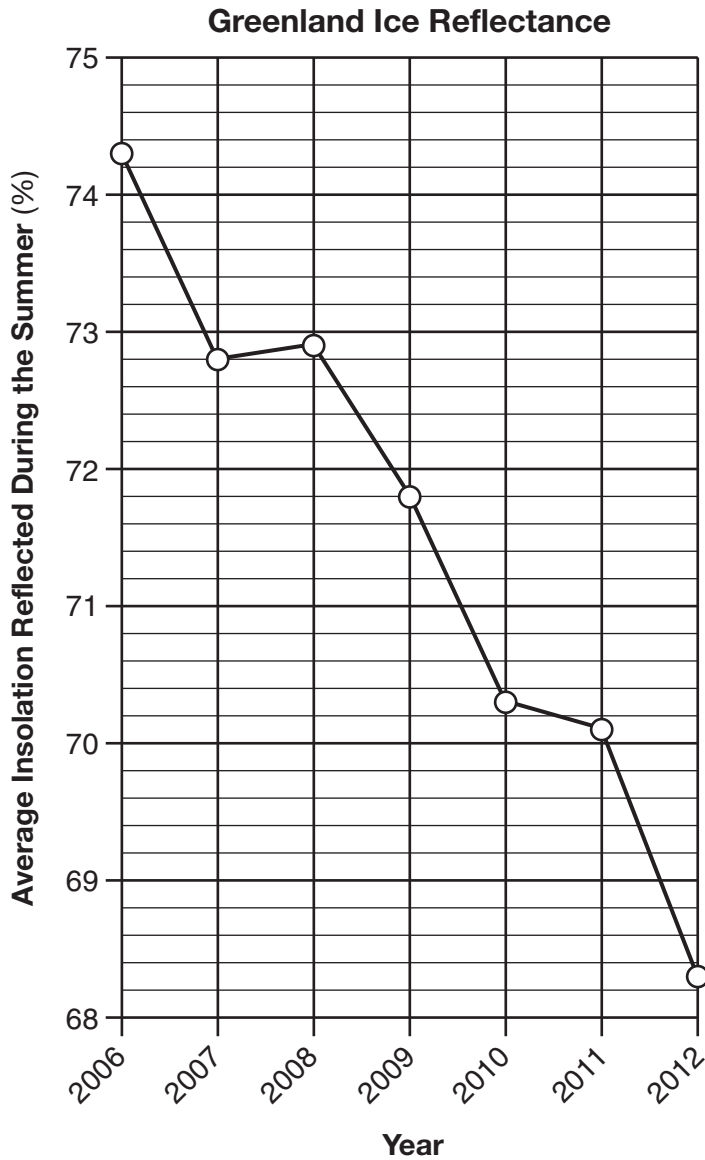
- increases
- becomes greater
- more sediment
- Less sediment is left behind in the sluice box.

82 [1] Allow 1 credit for 15.44 g *or* 15.4 g *or* 15 g.

83 [1] Allow 1 credit if the centers of *all seven* 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 if *both* the insolation-reflected trend and the inferred change in size are correct. Acceptable responses include, but are not limited to:

Insolation-reflected trend:

- From 2006 to 2012, the ice sheet reflectivity generally decreased.
- became less
- lower

Inferred size change:

- The ice sheet became smaller.
- less
- shrunk or melted
- decreased

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

- light in color
- smooth
- Ice and snow are white.
- shiny/glassy

Regents Examination in Physical Setting/Earth Science

August 2016

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

The Chart for Determining the Final Examination Score for the August 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, August 18, 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

August 2016 Physical Setting/Earth Science			
Question Numbers			
Key Ideas/Performance Indicators	Part A	Part B	Part C
Standard 1			
Math Key Idea 1		60	67, 82, 83
Math Key Idea 2	18, 26		66, 78, 81, 84
Math Key Idea 3		55	
Science Inquiry Key Idea 1		57, 58	68, 69, 85
Science Inquiry Key Idea 2			79
Science Inquiry Key Idea 3	1, 4, 7, 10, 13, 14, 15, 16, 18, 20, 22, 25, 30, 35	36, 37, 38, 39, 40, 41, 42, 43, 49, 51, 52, 53, 59, 64	69, 70, 71, 75, 77, 80, 82
Engineering Design Key Idea 1			
Standard 2			
Key Idea 1			
Key Idea 2			
Key Idea 3		62	
Standard 6			
Key Idea 1		54	
Key Idea 2	16, 19, 20, 21, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35	39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 59, 61, 63, 65	66, 67, 72, 73, 74, 76, 77, 78, 79, 81, 83, 84
Key Idea 3		60	
Key Idea 4			
Key Idea 5	26	65	72, 73, 74
Key Idea 6	12		
Standard 7			
Key Idea 1			
Key Idea 2		62	
Standard 4			
Key Idea 1	1, 2, 3, 4, 5, 13, 14, 16, 24, 26, 27, 28, 29, 31	36, 38, 45, 46, 47, 50, 51, 54, 55, 56, 57, 58, 65	66, 67, 68, 69, 70, 71, 72, 73, 74, 75
Key Idea 2	6, 7, 8, 9, 10, 11, 12, 15, 17, 18, 19, 21, 23, 30, 32, 33, 34, 35	37, 39, 40, 41, 48, 49, 59, 60, 61, 62, 63, 64	76, 77, 78, 79, 80, 81, 83, 84, 85
Key Idea 3	20, 22, 25	42, 43, 44, 52, 53	82
Reference Tables			
ESRT 2011 Edition (Revised)	1, 4, 7, 10, 13, 14, 15, 16, 18, 20, 22, 25, 30, 35	36, 37, 38, 39, 40, 41, 42, 43, 51, 52, 53, 59, 64	69, 70, 71, 75, 77, 80, 82