

FOR TEACHERS ONLY

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

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

Thursday, January 26, 2017 — 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 2	28 3
2 2	11 3	20 3	29 1
3 3	12 4	21 3	30 2
4 1	13 3	22 1	31 2
5 3	14 1	23 2	32 2
6 4	15 1	24 1	33 4
7 2	16 1	25 2	34 3
8 4	17 2	26 4	35 4
9 2	18 3	27 4	

Part B–1

36 4	40 4	44 4	48 2
37 1	41 2	45 3	49 3
38 3	42 1	46 3	50 1
39 4	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 26, 2017. 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 for Big Bang *or* Big Bang Theory.

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

- red shift
- cosmic background radiation
- Doppler Effect
- Galaxies are moving away from each other.
- Galaxies are moving away from Earth.
- gravity waves

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

- gravity
- gravitational attraction/gravitational pull

54 [1] Allow 1 credit for fusion *or* nuclear fusion.

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

- March 19 *or* March 20 *or* March 21 *or* March 22
- Sept. 21 *or* Sept. 22 *or* Sept. 23 *or* September 24
- vernal equinox *or* autumnal equinox
- equinox
- first day of spring *or* first day of fall

56 [1] Allow 1 credit for a response that indicates a time value of 9 a.m. Acceptable responses include, but are not limited to:

- 9:00 a.m.
- 9 o'clock in the morning
- 0900

57 [1] Allow 1 credit if *all three* student latitudes and *all three* student longitudes are correct.

**Position of Hurricane Sandy from
October 24, 2012 to October 31, 2012**

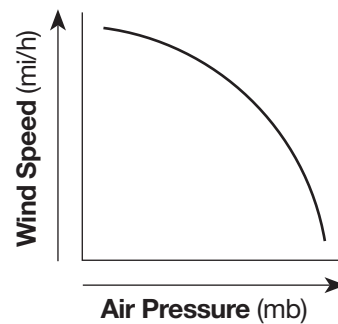
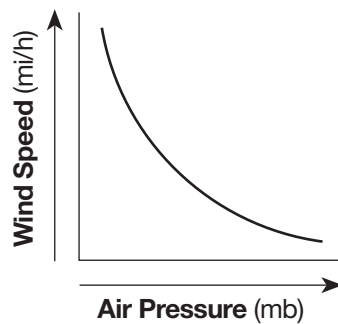
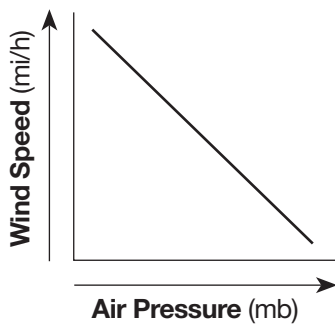
Date	Latitude°(N)	Longitude°(W)
October 24	17	77
October 25	22	76
October 26	27	77
October 27	29	76
October 28	32	73
October 29	37	71
October 30	40	78
October 31	42	80

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

- clockwise and outward
- The winds circulate clockwise.
- The winds blow away/diverge from the center of the high.

59 [1] Allow 1 credit for a line showing that, generally, as air pressure increases, wind speed decreases.

Examples of 1-credit responses:



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

- Hurricane Sandy moved over land.
- lack of warm water to evaporate and provide energy for the hurricane
- lack of moisture to supply the hurricane energy

Note: Do *not* allow credit for “pressure increased” or “wind speed decreased” because these are a result of a hurricane moving over land, *not* a cause of the weakening of the hurricane.

61 [1] Allow 1 credit for *D* and *E*.

62 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- 4600 million years ago
- 4.6×10^3 million years ago

Note: If the student crosses out million years ago, allow credit if an equivalent value is expressed in other units (e.g., 4.6 billion years ago).

63 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- Oceanic oxygen began to enter the atmosphere.
- Excess oxygen in the oceans escaped into the atmosphere.
- A buildup of oxygen began.
- Photosynthetic bacteria released oxygen.

64 [1] Allow 1 credit for trilobites.

65 [1] Allow 1 credit for Precambrian *or* Archean.

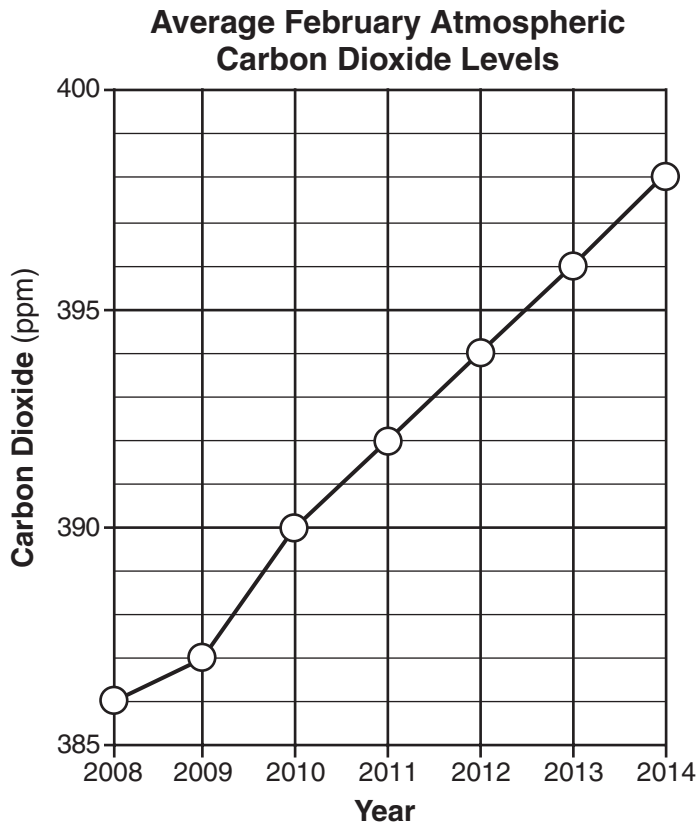
Part C

Allow a maximum of 20 credits for this part.

- 66 [1] Allow 1 credit if *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 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.



- 67 [1] Allow 1 credit for troposphere.

- 68 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- water vapor/ H_2O
- methane/ CH_4
- nitrous oxide/ N_2O/N_xO
- ozone/ O_3
- chlorofluorocarbons/CFCs

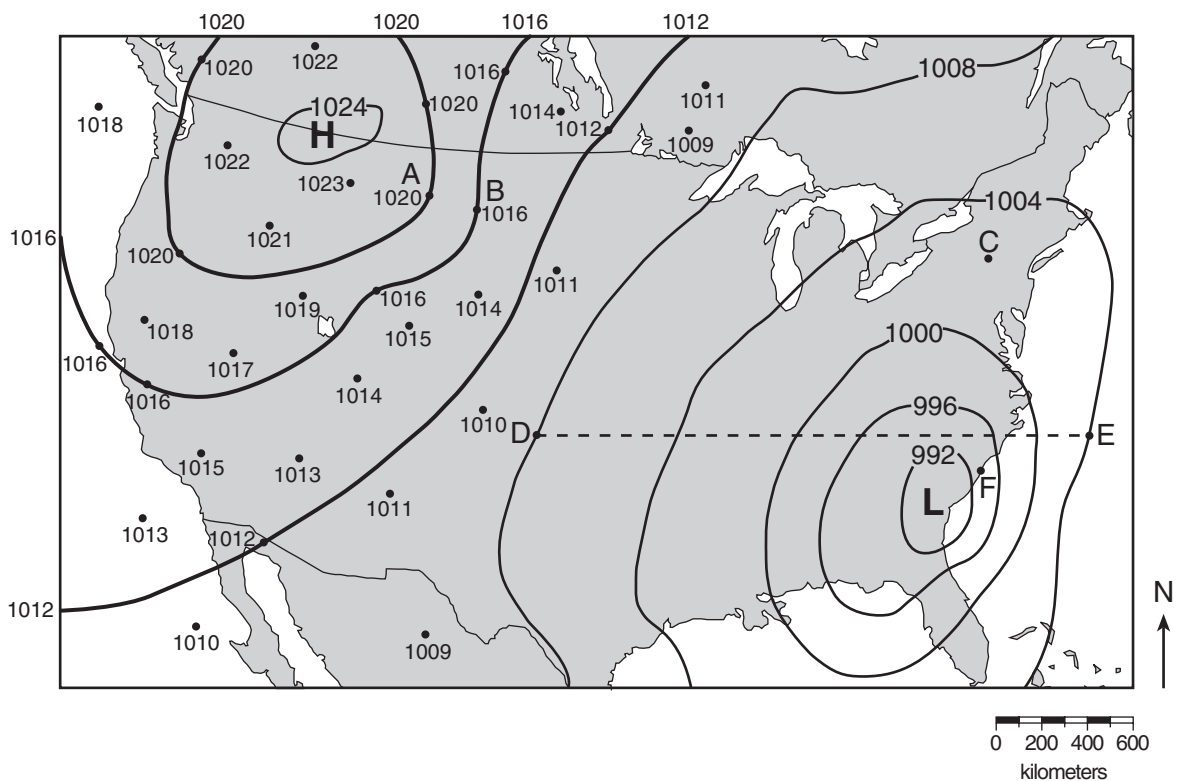
69 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- Plant more trees/reduce deforestation.
- Use public transportation/carpooling.
- Burn less fossil fuel.
- Use energy-efficient appliances/lightbulbs.
- Convert to alternative/renewable energy (e.g., solar, wind).

70 [1] Allow 1 credit if *all three* isobars are correctly drawn and the isobars extend to the edges of the map.

Note: If additional isobars are drawn, all must be drawn correctly to receive credit.

Example of a 1-credit response:



71 [1] Allow 1 credit for 30.12 in of Hg.

72 [1] Allow 1 credit for any value from 0.016 to 0.027 mb/km.

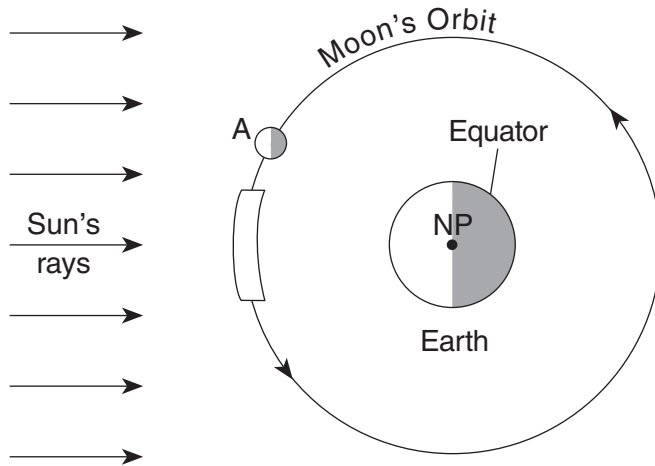
Note: Do *not* allow credit for $\frac{4}{200}$ or $\frac{1}{50}$ because this does not show a complete calculation.

73 [1] Allow 1 credit for any value greater than 988 but less than 992 mb.

74 [1] Allow 1 credit if the center of the **X** is within or touches the box on the Moon's orbit, as 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.

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



(Not drawn to scale)

75 [1] Allow 1 credit for 27.3 d or $27\frac{1}{3}$ d.

76 [1] Allow 1 credit if the student shades more than half of the Moon, leaving a lighted portion on the left to indicate a crescent, as shown below.

Examples of 1-credit responses:



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

- The Moon’s orbit has an elliptical shape.
- slightly eccentric
- almost a circle/nearly circular
- oval
- has an eccentricity of 0.055

Note: Do *not* allow credit for “circle” or “circular” alone because the eccentricity of the Moon’s orbit is not zero.

78 [1] Allow 1 credit for Erie-Ontario Lowlands, *or* Erie-Ontario Plains, *or* Interior Lowlands.

79 [1] Allow 1 credit for dolomite *or* $\text{CaMg}(\text{CO}_3)_2$.

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

- North America was located on/near the equator.
- North America was located at a lower latitude.
- It was farther south.
- mostly in the Southern Hemisphere
- farther east
- southeast

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

- the collision between North America and a volcanic island arc
- closing of the western part of the Iapetus Ocean
- crustal uplift
- convergence

82 [1] Allow 1 credit for quartz.

83 [1] Allow 1 credit for placing only *four* **X**s in the correct columns, as shown below.

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

Mineral Name	Felsic	Mafic
Potassium feldspar	X	
Olivine		X
Quartz	X	
Pyroxene		X

84 [1] Allow 1 credit for *both* oxygen (O) *and* silicon (Si).

85 [1] Allow 1 credit for *both* olivine *and* quartz.

Regents Examination in Physical Setting/Earth Science

January 2017

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

The Chart for Determining the Final Examination Score for the January 2017 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 26, 2017. 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

January 2017 Physical Setting/Earth Science			
Question Numbers			
Key Ideas/Performance Indicators	Part A	Part B	Part C
Standard 1			
Math Key Idea 1	9, 10, 20, 23	56	66, 72
Math Key Idea 2	5, 18, 20, 21	49, 57, 59	67
Math Key Idea 3		63	
Science Inquiry Key Idea 1	14, 25, 32	51, 52, 53, 54, 55, 60	
Science Inquiry Key Idea 2			
Science Inquiry Key Idea 3	5, 6, 7, 8, 10, 12, 14, 15, 21, 22, 30, 33	39, 43, 44, 45, 46, 47, 49, 61, 62, 63, 64, 65	67, 71, 72, 75, 77, 78, 79, 80, 81, 82, 83, 84, 85
Engineering Design Key Idea 1			
Standard 2			
Key Idea 1			
Key Idea 2			
Key Idea 3			
Standard 6			
Key Idea 1	15, 26	36, 37, 38, 41, 44, 50	68, 83
Key Idea 2	7, 18, 19, 25, 26, 28, 32, 33, 34, 35	36, 37, 39, 40, 41, 43, 55, 56, 60, 61, 63, 64, 65	70, 73, 76, 82, 85
Key Idea 3	33		73
Key Idea 4			
Key Idea 5	16, 34	42, 48, 56, 58	70, 74, 76
Key Idea 6			
Standard 7			
Key Idea 1			69
Key Idea 2			
Standard 4			
Key Idea 1	1, 2, 3, 4, 5, 6, 7, 8, 16, 17, 20, 31, 32, 33, 34	36, 37, 38, 41, 42, 43, 51, 52, 53, 54, 55, 56, 57, 61, 62, 63, 64, 65	74, 75, 76, 77, 81
Key Idea 2	9, 10, 11, 12, 13, 14, 15, 18, 19, 21, 22, 23, 24, 25, 26, 27, 28, 29, 35	39, 40, 45, 46, 48, 49, 50, 58, 59, 60	66, 67, 68, 69, 70, 71, 72, 73, 78, 80
Key Idea 3	30	44, 47	79, 82, 83, 84, 85
Reference Tables			
ESRT 2011 Edition (Revised)	5, 6, 8, 10, 12, 14, 15, 21, 22, 23, 30, 33	39, 44, 45, 46, 47, 49, 61, 62, 63, 64, 65	67, 71, 72, 75, 77, 78, 79, 80, 81, 82, 83, 84, 85