

# 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 25, 2018 — 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 ..... 1 .....	10 ..... 2 .....	19 ..... 4 .....	28 ..... 1 .....
2 ..... 3 .....	11 ..... 1 .....	20 ..... 4 .....	29 ..... 3 .....
3 ..... 4 .....	12 ..... 4 .....	21 ..... 3 .....	30 ..... 1 .....
4 ..... 3 .....	13 ..... 1 .....	22 ..... 2 .....	31 ..... 3 .....
5 ..... 4 .....	14 ..... 4 .....	23 ..... 2 .....	32 ..... 1 .....
6 ..... 2 .....	15 ..... 2 .....	24 ..... 3 .....	33 ..... 4 .....
7 ..... 4 .....	16 ..... 3 .....	25 ..... 4 .....	34 ..... 1 .....
8 ..... 1 .....	17 ..... 4 .....	26 ..... 2 .....	35 ..... 2 .....
9 ..... 2 .....	18 ..... 3 .....	27 ..... 3 .....	

**Part B–1**

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

## 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 25, 2018. 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:
- As particle size decreases, the amount of water retained increases.
  - The smaller particles retained more water.
  - Larger particles retain less water.
  - inverse relationship

- 52 [1] Allow 1 credit for coarse pebbles.

**Note:** Do *not* allow credit for pebbles alone. (This is not specific enough for choosing an answer from the data table.)

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

Relative time for star C:

- stays in main sequence longer
- greater amount of time/more time
- Star A leaves the main sequence sooner.

Explanation:

- Star C is less massive/smaller.
- It is cooler.
- Star C uses up its core hydrogen more slowly.
- Star A is more massive/larger.
- The less massive a star is in the cluster, the longer it remains a main sequence star.

- 54 [1] Allow 1 credit for Milky Way *or* Milky Way galaxy.

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

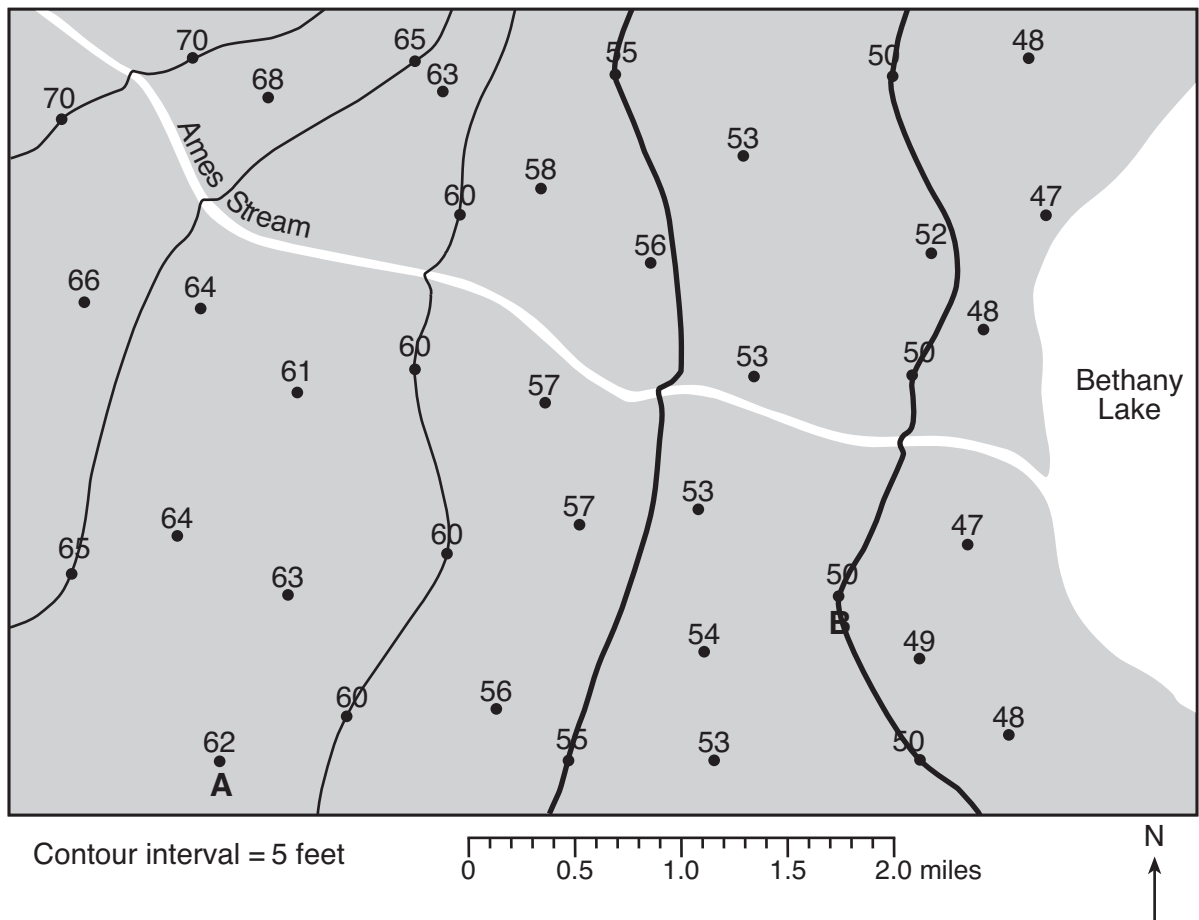
- nuclear fusion
- fusion
- Hydrogen atoms combine to form helium.
- Lighter elements change into a heavier element.

56 [1] Allow 1 credit for correctly drawing *both* the 50-ft and 55-ft contour lines to the edges of the map.

**Note:** Allow credit even if the student's lines do *not* make a V-shape when the stream is crossed.

If additional contour lines are drawn, *all* must be correctly drawn to receive credit.

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



57 [1] Allow 1 credit for any value from 3.87 to 4.14 ft/mi *or* any value from  $-3.87$  to  $-4.14$  ft/mi.

58 [1] Allow 1 credit if *both* the compass direction and evidence are correct. Acceptable responses include, but are not limited to:

Compass direction:

- southeast/SE
- east
- ESE

Evidence:

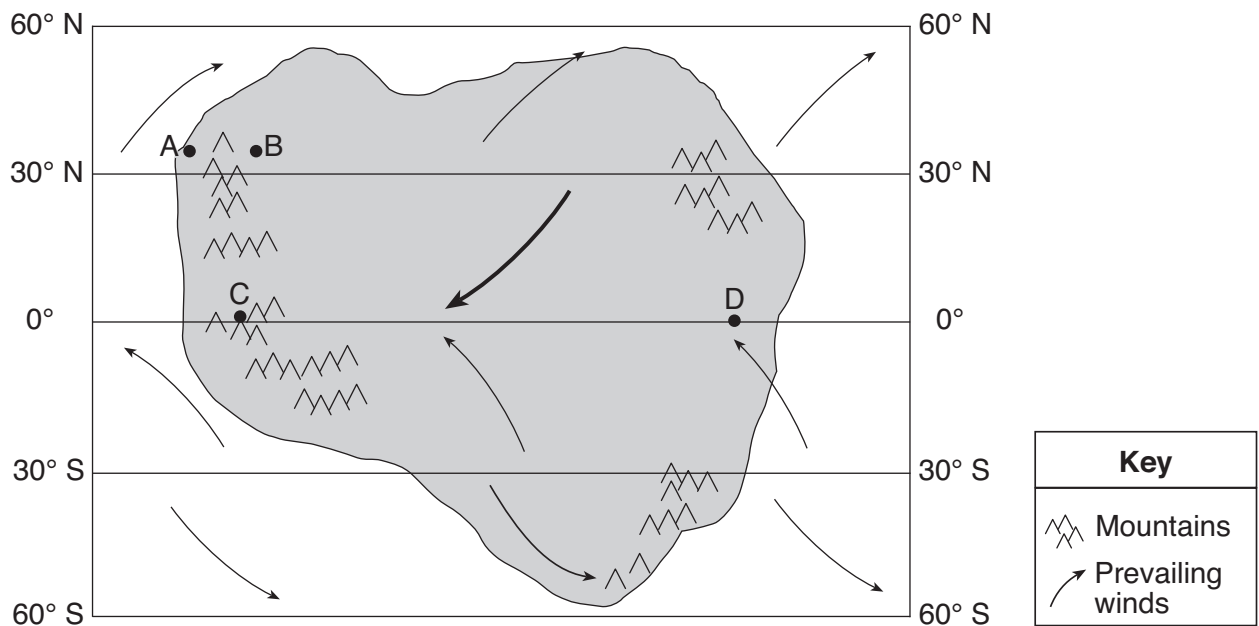
- The stream flows from a higher contour line elevation in the west to a lower contour line elevation in the east.
- Contour lines bend upstream when they cross a stream; streams flow in the opposite direction.
- Contour lines make a V-shape that points uphill where they cross a stream/law of the Vs.
- The contour lines point uphill.
- Streams flow out of the open end of the Vs.
- This stream flows from a higher elevation to a lower elevation.

**Note:** Do *not* allow credit for “water flows downhill” because this does not indicate how contour lines show stream direction.

59 [1] Allow 1 credit for an arrow drawn curving to the right from northeast to southwest between 30° N and 0°.

**Note:** If more than one curved arrow is drawn, *all* must be correctly drawn to receive credit.

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



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

Relative average air temperature at *B*:

- warmer
- hotter
- higher

Relative average moisture conditions at *B*:

- drier
- less moist/less humid
- more arid
- lower/less

**61** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- elevation
- altitude
- height above sea level
- Location *C* is on the top of a mountain.
- Location *D* is at a lower elevation.
- *C* is located in the mountains.

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

- Earth's rotation
- spinning/turning on an axis
- rotation

**63** [1] Allow 1 credit for 12 h.

**64** [1] Allow 1 credit for Elmira.

**65** [1] Allow 1 credit for 42°.

**Note:** Do *not* allow credit if a compass direction is given (e.g., 42 N or 42° N) because that indicates latitude, *not* altitude.

### Part C

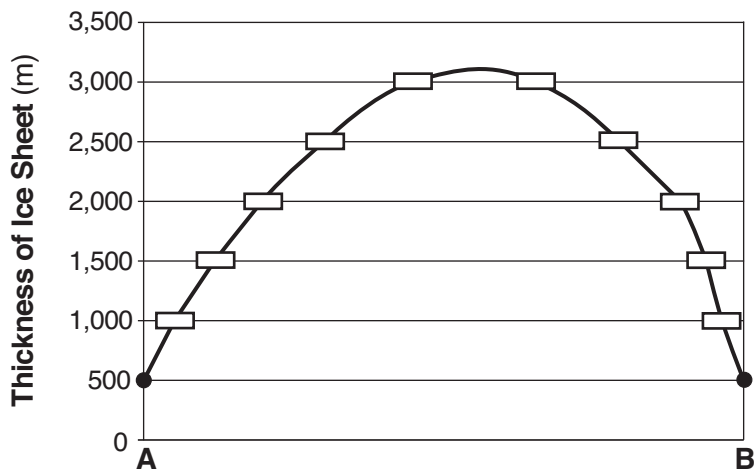
Allow a maximum of 20 credits for this part.

- 66 [1] Allow 1 credit if the centers of *all ten* student plots are located within or touch the rectangles shown below and *all twelve* plots are correctly connected with a line that passes within or touches the rectangles from point A to point B. The high point of the line must extend above 3000 m, but below 3500 m.

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

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

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



- 67 [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- parallel scratches/striaations on the bedrock surface
  - grooves in the bedrock
  - drumlin
  - glacial erratics
  - finger-shaped lakes
  - moraines
  - U-shaped valleys
  - outwash plains
  - eskers

68 [1] Allow 1 credit if *both* gases are correct. Acceptable responses include, but are not limited to:

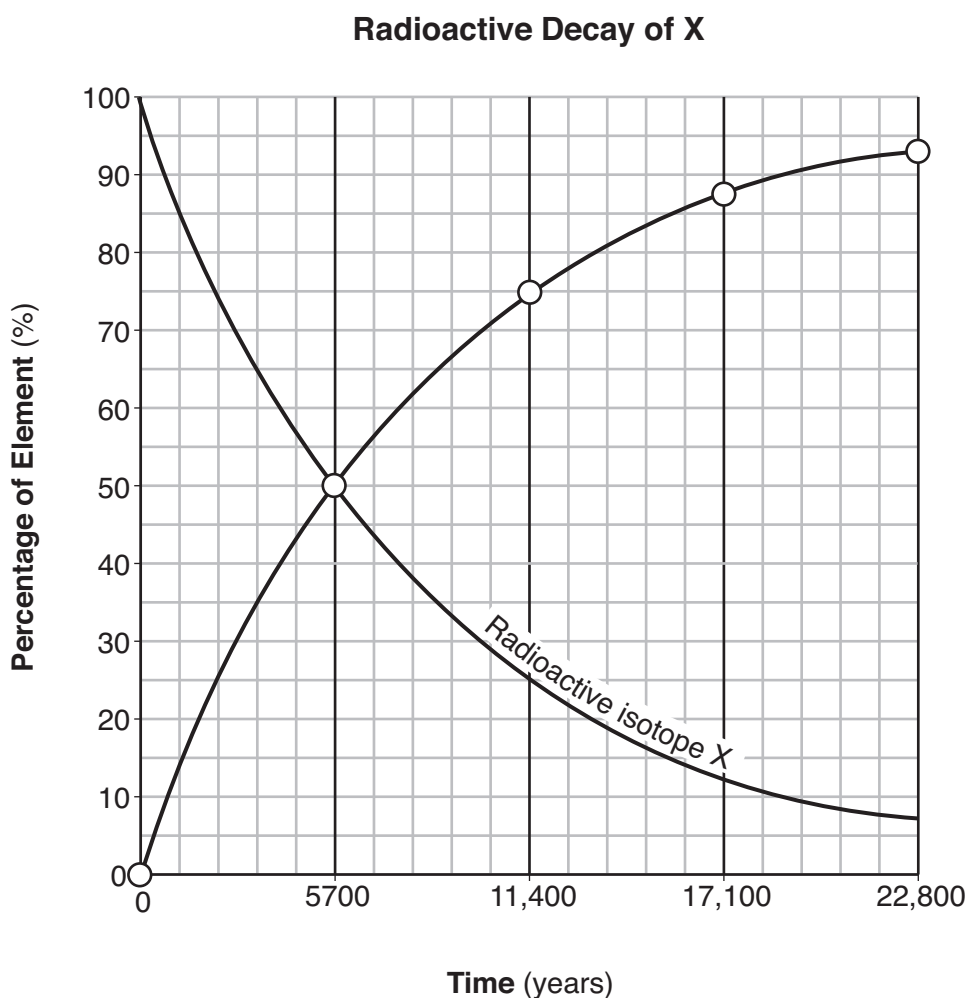
- carbon dioxide *or*  $\text{CO}_2$
- methane *or*  $\text{CH}_4$
- water vapor *or*  $\text{H}_2\text{O}(\text{g})$
- ozone *or*  $\text{O}_3$
- nitrous oxide *or*  $\text{N}_2\text{O}$
- chlorofluorocarbons/CFCs

69 [1] Allow 1 credit if the centers of *all five* 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-drawn 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 booklet be used to ensure reliability in rating.

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





70 [1] Allow 1 credit for 11,400 y.

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

Radioactive isotope:

— Carbon-14/C-14

—  $^{14}\text{C}$

Stable disintegration product:

— Nitrogen-14/N-14

—  $^{14}\text{N}$

—  $^{14}\text{C} \rightarrow ^{14}\text{N}$

**Note:** Do *not* allow credit for “carbon” and “nitrogen” alone because these elements have more than one isotope, and the specific radioactive isotope and stable disintegration product are needed.

72 [1] Allow 1 credit if the center of the dot is located within or touches the clear banded area at position 2 shown below.

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

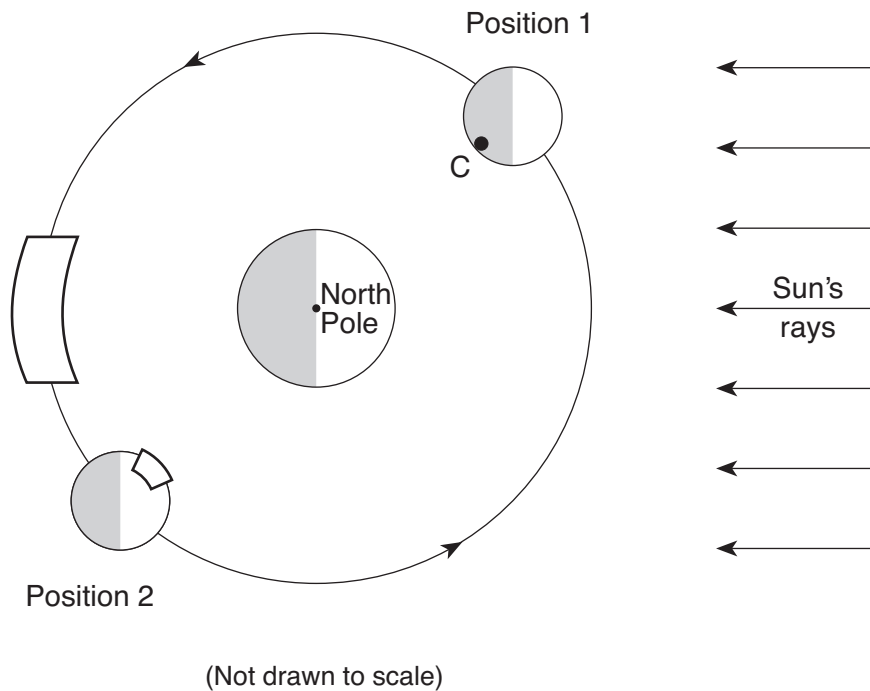
It is recommended that an overlay of the same scale as the student answer booklet be used to ensure reliability in rating.

73 [1] Allow 1 credit if the center of the student's **X** is within or touches the clear banded area on the Moon's orbit shown 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 booklet be used to ensure reliability in rating.

**Example of a 2-credit response for questions 72 and 73:**



74 [1] Allow 1 credit for any value from 13 d to 14 d.

75 [1] Allow 1 credit if the student shades more than half of the Moon, leaving a lighted portion on the right edge as shown below.

**Examples of 1-credit responses:**



76 [1] Allow 1 credit if *all four* weather variables are correctly recorded, as shown below.

Atlanta, Georgia	
Weather Variable	Actual Value
Air temperature	58 °F
Barometric pressure	1023.2 mb
Wind speed	15 knots
Wind direction	from the northeast/NE <i>or</i> NNE <i>or</i> ENE

77 [1] Allow 1 credit for stationary front.

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

- The dewpoint and air temperature are close together./high relative humidity
- 100% cloud cover/overcast
- Tampa is close to a front.
- The air pressure is low.

79 [1] Allow 1 credit if *both* responses are correct.

Location A: Nazca Plate

Location B: South American Plate

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

Relative age at location *D*:

- younger
- more recent
- newer

Explanation:

- New seafloor is forming at the Mid-Atlantic Ridge closer to *D*.
- Location *C* is farther from an ocean ridge.
- Surface oceanic bedrock moves away from the Mid-Atlantic Ridge after forming.
- Convection currents carry older rock away from the ridge as new crust forms.
- Magma coming from the rift's volcanoes forms new basalt.
- New sea floor forms at a divergent boundary.

- 81 [1] Allow 1 credit for tsunami *and* an acceptable emergency action. Acceptable responses include, but are not limited to:

Emergency action:

- Evacuate to higher ground.
- Go to higher floors in well-built structures.
- Leave beaches and low-lying land areas.
- Move inland/away from coast.

**Note:** Do *not* accept “tidal wave” because a tsunami is not tidal in nature and is not caused by tides.

- 82 [1] Allow 1 credit if *all four* responses are correct as shown in the chart below. Acceptable responses include, but are not limited to:

Letter	Missing Information
A	metamorphic
B	coarse
C	limestone or bituminous coal
D	anthracite coal <i>or</i> hornfels <i>or</i> quartzite <i>or</i> marble <i>or</i> metaconglomerate

**Note:** Do *not* allow credit for “coal” alone for *C* or *D* because it is not specific enough.

- 83 [1] Allow 1 credit for sodium/Na *and* chlorine/Cl.

- 84 [1] Allow 1 credit for plagioclase feldspar *or* plagioclase.

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

- 85 [1] Allow 1 credit for schist *or* gneiss.

## Regents Examination in Physical Setting/Earth Science

January 2018

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

**The Chart for Determining the Final Examination Score for the January 2018 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 25, 2018. 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 2018 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		39, 40, 57	66, 69, 74
Math Key Idea 2	10, 21, 23, 27	38, 51	70, 84
Math Key Idea 3		65	
Science Inquiry Key Idea 1	3, 8, 11, 13, 14, 18, 31	46, 47, 48, 50, 53, 54, 55, 62, 63	67, 78, 80
Science Inquiry Key Idea 2			
Science Inquiry Key Idea 3	2, 3, 4, 5, 7, 8, 10, 14, 15, 16, 17, 21, 22, 23, 24, 26, 27, 28, 29, 34, 35	36, 39, 40, 45, 49, 53, 57, 59, 65	71, 74, 76, 77, 78, 79, 82, 83, 84, 85
Engineering Design Key Idea 1			
<b>Standard 2</b>			
Key Idea 1			78
Key Idea 2			
Key Idea 3			81
<b>Standard 6</b>			
Key Idea 1	10, 32	37, 43, 50, 53	67, 80
Key Idea 2	5, 6, 9, 17, 19, 20, 24, 26, 30, 31, 32, 33, 34, 35	36, 37, 40, 41, 42, 43, 44, 45, 46, 47, 48, 50, 52, 56, 58, 59, 60, 61	66, 71, 72, 73, 75, 76, 77, 78, 79, 80, 82, 83
Key Idea 3			
Key Idea 4			
Key Idea 5	8, 9, 33	38, 43, 44, 64	70, 72, 73, 75
Key Idea 6			
<b>Standard 7</b>			
Key Idea 1			68
Key Idea 2			81
<b>Standard 4</b>			
Key Idea 1	1, 2, 3, 4, 8, 9, 15, 16, 17, 18	38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 49, 51, 52, 53, 54, 55, 62, 63, 64, 65	69, 70, 71, 72, 73, 74, 75
Key Idea 2	5, 6, 7, 10, 11, 12, 13, 14, 19, 20, 21, 22, 23, 24, 25, 26, 27, 30, 32, 33, 35	36, 37, 48, 50, 56, 57, 58, 59, 60, 61	66, 67, 68, 76, 77, 78, 79, 80, 81
Key Idea 3	28, 29, 31, 34		82, 83, 84, 85
<b>Reference Tables</b>			
ESRT 2011 Edition (Revised)	2, 3, 4, 5, 7, 8, 10, 14, 15, 16, 17, 21, 22, 23, 24, 26, 27, 28, 29, 34, 35	36, 39, 40, 45, 49, 57, 59, 65	71, 74, 76, 77, 78, 79, 82, 83, 84, 85