

# FOR TEACHERS ONLY

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

## PHYSICAL SETTING/EARTH SCIENCE

Thursday, August 13, 2015 — 12:30 to 3:30 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 ..... 3 .....	19 ..... 4 .....	28 ..... 3 .....
2 ..... 3 .....	11 ..... 4 .....	20 ..... 3 .....	29 ..... 4 .....
3 ..... 3 .....	12 ..... 2 .....	21 ..... 2 .....	30 ..... 2 .....
4 ..... 4 .....	13 ..... 1 .....	22 ..... 1 .....	31 ..... 1 .....
5 ..... 2 .....	14 ..... 2 .....	23 ..... 4 .....	32 ..... 2 .....
6 ..... 2 .....	15 ..... 3 .....	24 ..... 4 .....	33 ..... 4 .....
7 ..... 1 .....	16 ..... 4 .....	25 ..... 2 .....	34 ..... 1 .....
8 ..... 3 .....	17 ..... 1 .....	26 ..... 1 .....	35 ..... 3 .....
9 ..... 1 .....	18 ..... 4 .....	27 ..... 3 .....	

**Part B-1**

36 ..... 4 .....	40 ..... 4 .....	44 ..... 1 .....	48 ..... 4 .....
37 ..... 1 .....	41 ..... 3 .....	45 ..... 4 .....	49 ..... 3 .....
38 ..... 2 .....	42 ..... 2 .....	46 ..... 2 .....	50 ..... 1 .....
39 ..... 1 .....	43 ..... 1 .....	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, August 13, 2015. 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.**

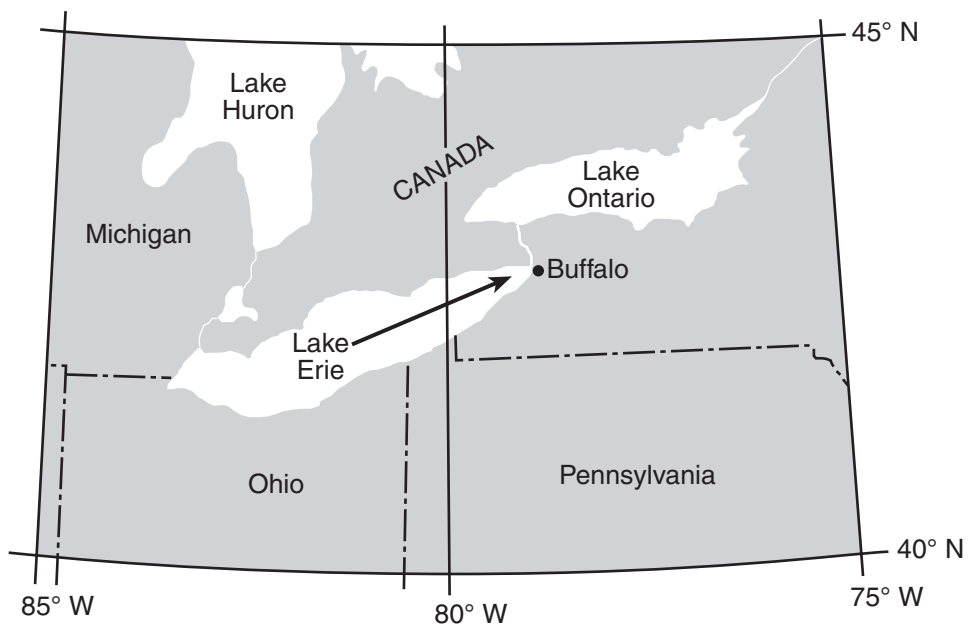
- 51** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Cooler air near the lake remains close to the surface because it is more dense than the surrounding air.
  - Cold air over the lake is more dense.
  - Cooler air over Lake Erie is less likely to rise.
  - Convection is reduced.
  - Less evaporation occurs when the air is colder.
  - lack of moisture
  - Warm air rises to form clouds.

- 52** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- temperature/air temperature
  - The average temperature of the air is colder when Buffalo receives snow.

- 53** [1] Allow 1 credit for any arrow drawn from a southwest to northeast orientation on Lake Erie pointing toward Buffalo.

**Note:** Allow credit even if the arrow extends before Lake Erie or beyond Buffalo. If additional arrows are drawn, they need not be over Lake Erie, but must have a general SW to NE direction.

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

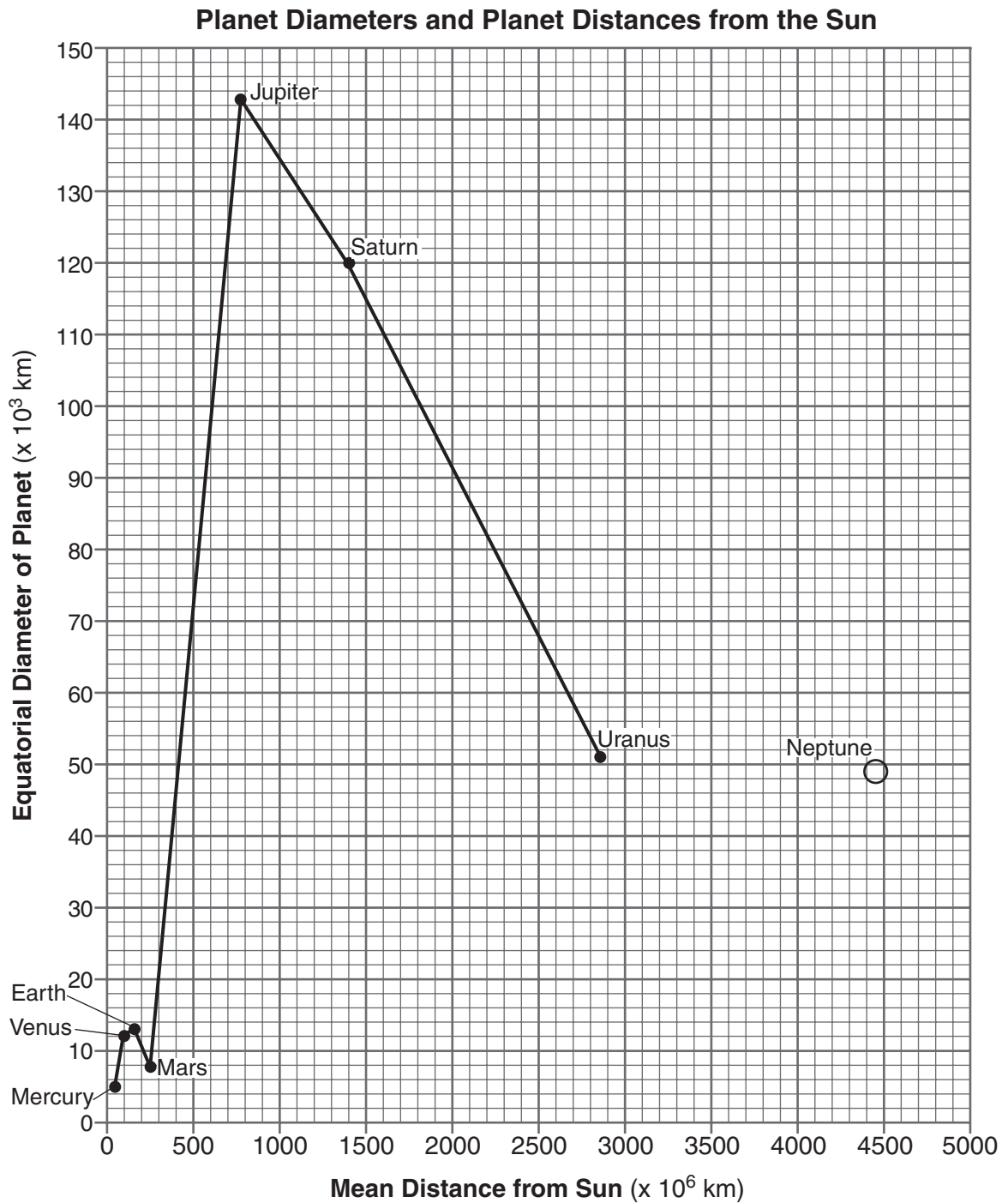


**54** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- The specific heat of water is greater than the specific heat of land or dry land, so the air over the land heats up faster than the air over the lake.
- More energy is required to heat up the same amount of water than to heat the same amount of land.
- Air has a lower specific heat than water.
- A lot of energy is used to melt the ice on Lake Erie.
- Lake Erie is still covered by ice.
- The darker land surface absorbs greater insolation.
- Land heats up faster than water.

55 [1] Allow 1 credit if the center of the **X** for Neptune is plotted within or touches the grid square that is circled as shown below.

**Note:** Allow credit if a symbol other than an **X** is used. Neptune need not be labeled.



56 [1] Allow 1 credit for indicating a diameter of any value from 1.6 cm to 1.9 cm.

**Note:** Allow credit for a shading anywhere along or on the centimeter scale as long as it is 1.6 cm to 1.9 cm long.

57 [1] Allow 1 credit if *both* responses are correct. Acceptable responses include, but are not limited to:

Jovian periods of revolution: — longer  
— greater  
— more time

Jovian periods of rotation: — shorter  
— less time

**Note:** Allow credit if the student answers “slower” for periods of revolution and “faster” for periods of rotation, even though these refer to rate, not to periods of time.

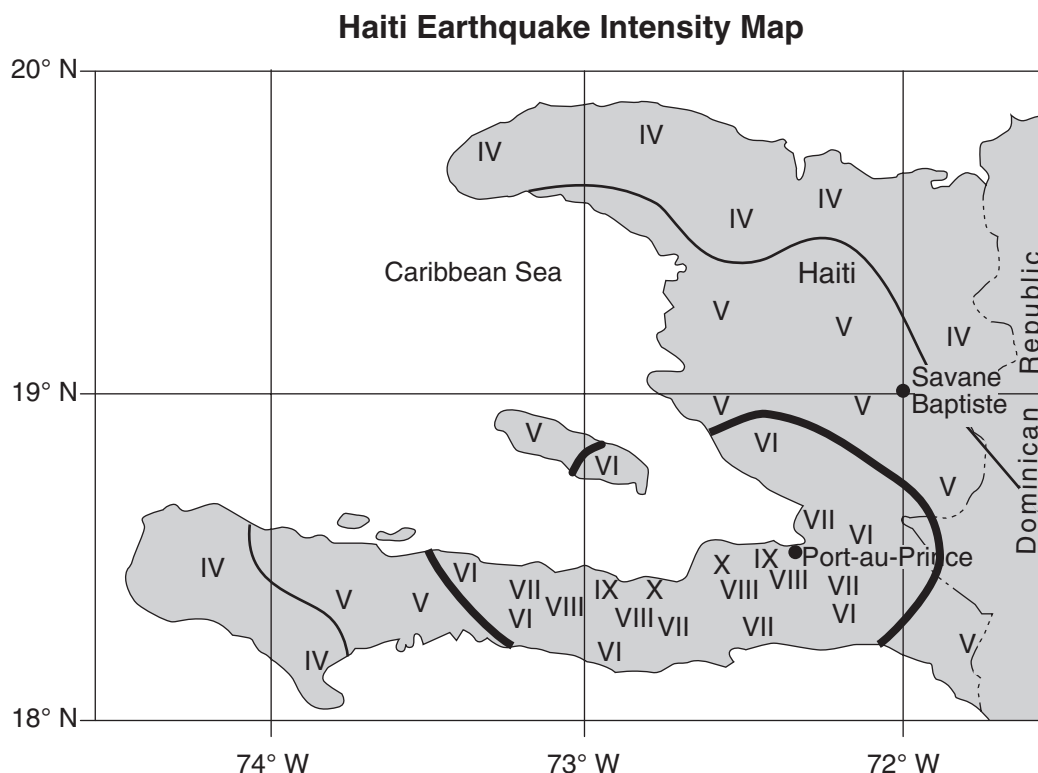
58 [1] Allow 1 credit for Mars.

59 [1] Allow 1 credit if boundary lines between V and VI are correctly drawn.

**Note:** Allow a credit even if a student-drawn line extends into the water.

Do *not* allow credit if the student-drawn line touches or passes through any Mercalli value. If extra Mercalli lines are drawn, all must be correct to receive credit.

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



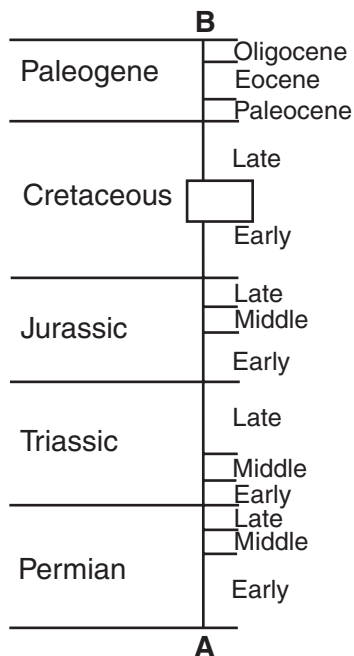
60 [1] Allow 1 credit if *both* responses are correct.

Latitude: 19° N

Longitude: 72° W

61 [1] Allow 1 credit for North American Plate and Caribbean Plate.

62 [1] Allow 1 credit for the center of an **X** within or touching the box 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.

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

— 0.006 cm to 0.2 cm

— 0.2 cm to 0.006 cm

**64** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- vascular plants
- flowering plants
- trees
- ferns
- plants
- plant materials

**Note:** Do *not* accept grasses because the earliest grasses appeared in the Oligocene.  
Do *not* accept the name of any index fossil found in the Earth Science Reference Tables because they did not live during the time that *Abysosaurus mcintoshii* lived.

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

- an asteroid impact
- an impact event
- a meteorite/meteor/meteoroid collision with Earth
- climate change
- a disruption of food chains/food webs
- comet impact

**Note:** Do *not* allow credit for “meteorite,” “meteor,” “meteoroid,” or “comet” alone because they do not describe a natural event.  
Do *not* allow credit for volcanic eruption because this is not the most widely inferred cause of dinosaur extinction.



## Part C

- 66 [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Both layers have contact metamorphism.
  - The layers were changed by the igneous intrusion.
  - The intrusion could only metamorphose layers that are already existing.
  - contact metamorphism

**Note:** Do *not* allow credit for “igneous intrusions are younger than the rock they cut across” because the intrusion does not cut across the shale layer.

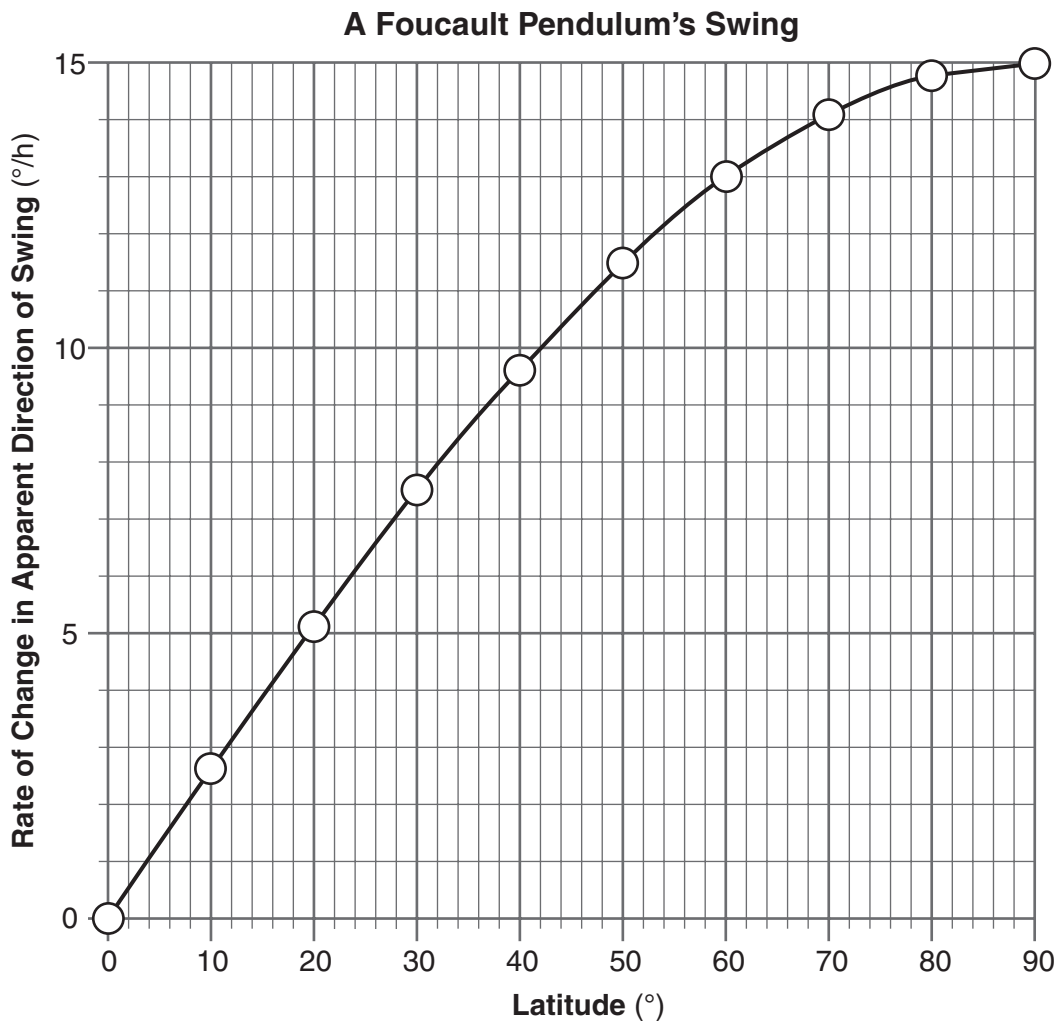
- 67 [1] Allow 1 credit for calcite.

- 68 [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- widespread distribution
  - lived for a short time
  - easily identified

- 69 [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Potassium-40 decays at a specific rate.
  - K-40 has a known half-life.
  - K-40 has a constant rate of decay.
  - K-40 decays at a rate independent of external factors.
  - Potassium-40 has a long half-life.
  - The half-life of K-40 is  $1.3 \times 10^9$  years.

70 [1] Allow 1 credit if the centers of *all ten* plots are within or touch the circles shown below and are correctly connected with a line passing within or touching the circles.

**Note:** Allow credit if a 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.



71 [1] Allow 1 credit for 24 h.

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

- rotation
- spin
- turning on its axis

**Note:** Do not allow credit for “faster rotation” or “shorter rotation” because these are scientifically incorrect with respect to the rotation of Mars compared to the rotation of Earth.

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

- As latitude increases, the Coriolis force increases.
- the closer to the equator, the weaker the Coriolis force
- The Coriolis force is strongest by the poles.
- direct relationship

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

- The sample is angular in appearance.
- It is not rounded.
- The edges are not worn off.

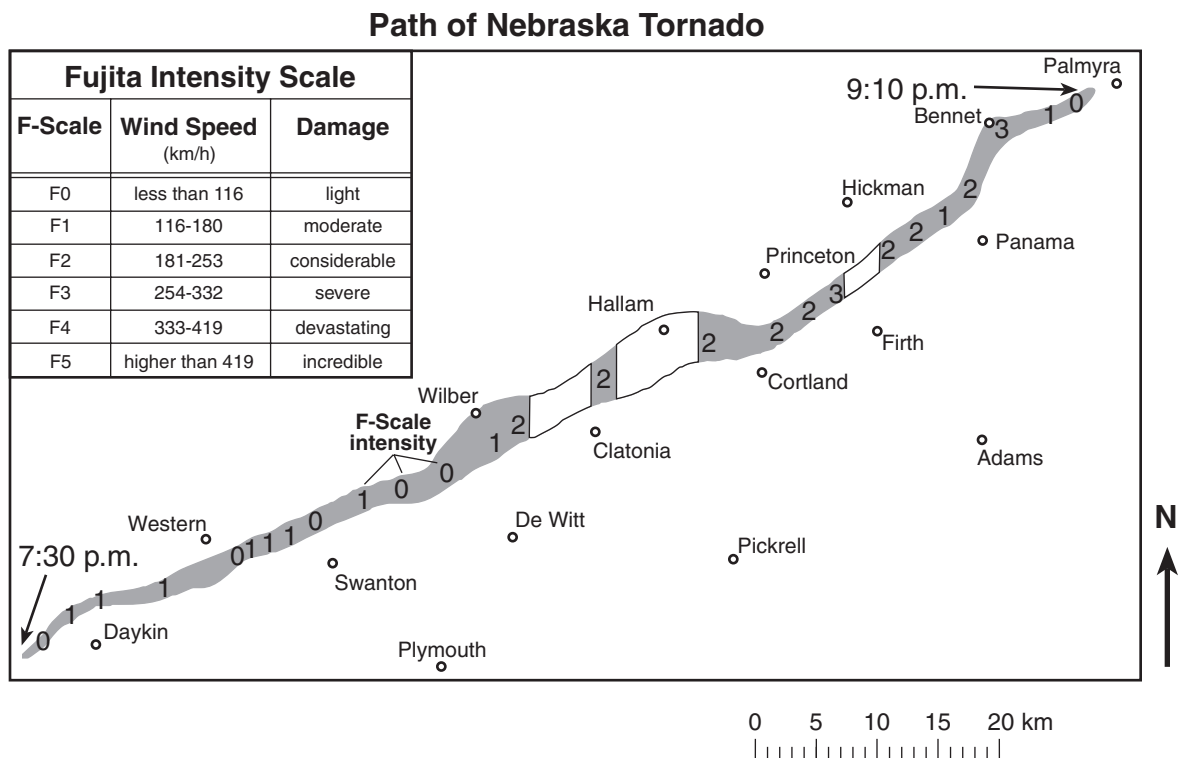
**Note:** Do *not* accept “not very weathered” or “no abrasion” because this does not describe an appearance or observable characteristic of the rock sample.

75 [1] Allow 1 credit for any value from 70 cm/s to 110 cm/s.

76 [1] Allow 1 credit for any value from 48 m/km to 52 m/km.

77 [1] Allow 1 credit if the center of the **X** is within or touches any of the clear areas along the path of the tornado shown below.

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



78 [1] Allow 1 credit for any value from 254 km/h to 332 km/h.

79 [1] Allow 1 credit for anemometer *or* wind speed meter.

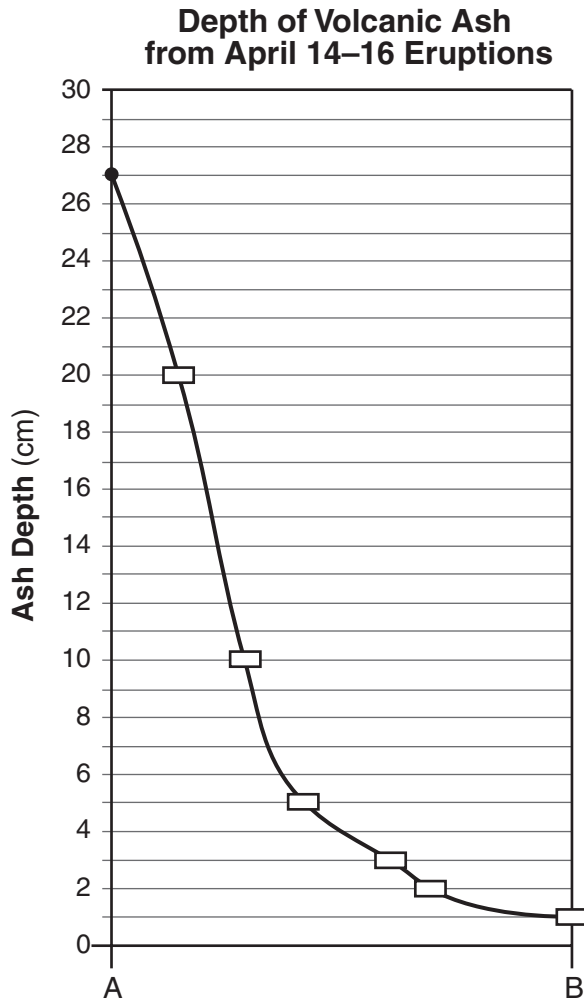
80 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- go into a basement or underground storm shelter
- go to an interior room
- stay away from windows
- get under something sturdy

**Note:** Do *not* allow credit for a response that indicates a safety precaution to prepare for a future tornado.

- 81 [1] Allow 1 credit if the centers of *all six* student plots are within or touch the rectangles shown below and *all seven* plots are correctly connected with a line that passes within or touches the rectangles from point A to point B.

**Note:** Allow credit if the line misses a plot but is still within or touches the rectangle.  
It is recommended that an overlay of the same scale as the student answer booklet be used to ensure reliability in rating.



- 82 [1] Allow 1 credit for troposphere.

- 83 [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- The ash most likely reflected/scattered the incoming solar radiation.
  - Less sunlight was received at Earth's surface.
  - The ash most likely blocked some of the sunlight.
  - Atmospheric transparency was reduced.
  - The cloud blocked the Sun.

- 84** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- A greater percentage by mass of smaller ash particles was carried farther.
  - The larger particles were carried shorter distances.
  - They tend to be a smaller size.
- 85** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Iceland is located above a mantle hotspot.
  - A tectonic plate boundary passes through Iceland.
  - Iceland is on a divergent plate boundary.
  - Iceland is located on a mid-ocean ridge.

## Regents Examination in Physical Setting/Earth Science

August 2015

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

**The Chart for Determining the Final Examination Score for the August 2015 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 13, 2015. 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>August 2015 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		44, 55	70, 76, 78, 81
Math Key Idea 2	5, 15, 25, 27, 32, 34	37, 38, 40, 42, 43, 49, 59	75, 84
Math Key Idea 3			71
Science Inquiry Key Idea 1	6, 27	36, 37, 41, 45, 47, 51, 55	66, 68, 72, 74, 79, 83, 85
Science Inquiry Key Idea 2			
Science Inquiry Key Idea 3	1, 2, 7, 8, 12, 13, 14, 15, 17, 18, 19, 20, 21, 23, 32, 33, 34, 35	38, 39, 50, 53, 54, 55, 56, 57, 58, 61, 62, 63, 64, 65	67, 69, 75, 76, 82, 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	8	39, 40	
Key Idea 2	7, 11, 12, 14, 15, 17, 18, 22, 25, 26, 27, 28, 29, 30, 31, 33, 35	36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 52, 53, 57, 58, 59, 60, 61, 62, 66	66, 68, 73, 77, 81
Key Idea 3		56, 57	
Key Idea 4			
Key Idea 5	3	46, 49, 53, 65	75, 83, 84
Key Idea 6			
<b>Standard 7</b>			
Key Idea 1			
Key Idea 2			80
<b>Standard 4</b>			
Key Idea 1	1, 2, 3, 4, 5, 6, 8, 9, 18, 19, 20, 22, 24, 25, 27, 33	36, 37, 42, 44, 45, 46, 47, 55, 56, 57, 58, 60, 62, 64, 65	66, 68, 69, 70, 71, 72, 73
Key Idea 2	7, 10, 11, 12, 13, 14, 15, 16, 17, 26, 28, 29, 30, 31	38, 39, 40, 41, 43, 48, 49, 50, 51, 52, 53, 54, 59, 61	74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85
Key Idea 3	21, 23, 32, 34, 35	63	67
<b>Reference Tables</b>			
ESRT 2011 Edition (Revised)	1, 2, 7, 8, 12, 13, 14, 15, 17, 18, 19, 20, 21, 23, 32, 33, 34, 35	38, 46, 50, 53, 54, 55, 56, 57, 58, 61, 62, 63, 64, 65	67, 69, 75, 76, 82, 85