

FOR TEACHERS ONLY

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

LIVING ENVIRONMENT

Wednesday, June 13, 2018 — 1:15 to 4:15 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.

Multiple Choice for Parts A, B-1, B-2, and D
Allow 1 credit for each correct response.

Part A			
1 2	9 4	17 3	25 4
2 4	10 3	18 1	26 2
3 2	11 4	19 4	27 3
4 1	12 3	20 3	28 1
5 2	13 4	21 1	29 4
6 4	14 2	22 1	30 1
7 1	15 2	23 3	
8 1	16 2	24 4	
Part B-1			
31 1	35 1	39 3	43 3
32 3	36 3	40 4	
33 2	37 3	41 4	
34 2	38 2	42 2	
Part B-2			
47 3	49 2	50 4	
Part D			
73 2	75 3	81 2	
74 1	76 3	82 2	

Directions to the Teacher

Follow the procedures below for scoring student answer papers for the Regents Examination in Living Environment. 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, Part C, and Part D 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.

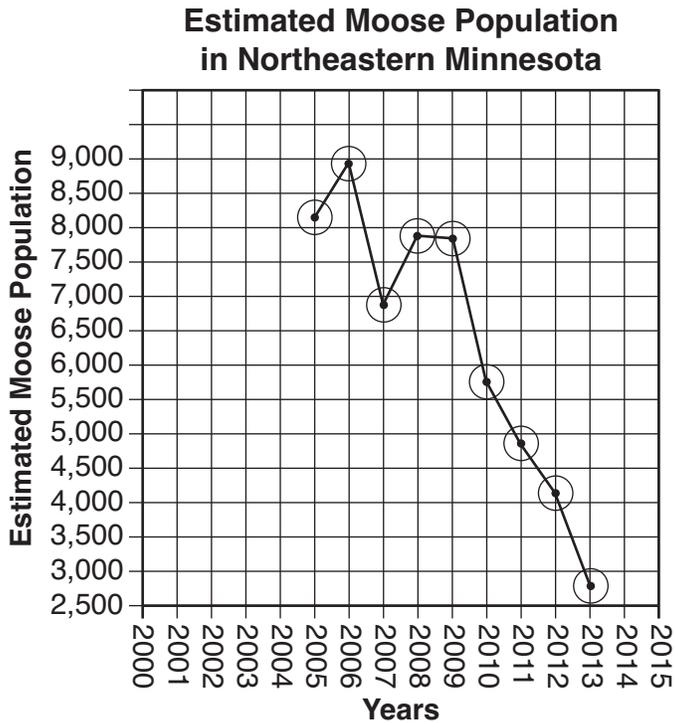
For hand scoring, raters should enter the scores earned in the appropriate boxes printed on the separate answer sheet. Next, the rater should add these scores and enter the total in the box labeled “Total Raw Score.” Then the student’s raw score should be converted to a scale score by using the conversion chart that will be posted on the Department’s web site at: <http://www.p12.nysed.gov/assessment/> on Wednesday, June 13, 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

- 44 [1] Allow 1 credit for completing an appropriate scale, without any breaks in the data, on the axis labeled “Estimated Moose Population.”
- 45 [1] Allow 1 credit for correctly plotting the data, connecting the points, and surrounding each point with a small circle.



Note: Allow credit if the points are correctly plotted, but not circled.

Do *not* assume that the intersection of the x - and y -axes is the origin $(0,0)$ unless it is labeled. An appropriate scale only needs to include the data range in the data table.

Do *not* allow credit if points are plotted that are not in the data table, e.g., $(0,0)$, or for extending lines beyond the data points.

- 46 [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Falls are longer and warmer, increasing the chances of ticks surviving and infesting moose.
 - Climate change can be predicted to improve conditions for winter ticks through earlier snowmelt in the spring.
 - Ticks that fall off the moose onto soil instead of snow will survive.

47 MC on scoring key

48 [1] Allow 1 credit for stating the result and supporting the answer.

- Species *K* did not survive. They were not able to adapt to their new environment.
- Species *K* became extinct because they could not survive in the changed environment.
- They became extinct. The diagram shows that they did not survive to the present.

49 MC on scoring key

50 MC on scoring key

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

- Energy is lost at each level as heat.
- Some energy is used by the organisms at each level and is not available to the organisms at the next level.
- Energy is lost.

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

- The overpopulation of deer in 1925 caused their habitat to be overgrazed. This did not allow the food sources in the area to regrow for future deer populations.
- In 1925, the deer ate too much food, lowering the amount of food available in future years.
- Overpopulation of deer in 1925 destroyed some of the resources deer needed, so fewer deer could live there.

Note: The student's response to the bulleted items in question 53–54 need *not* appear in the following order.

53 [1] Allow 1 credit for identifying *one* natural event that could cause the disruption indicated in the diagram. Acceptable responses include, but are not limited to:

- fire
- volcanic eruption
- hurricane/flood
- earthquake

54 [1] Allow 1 credit for explaining what would most likely happen to the new stable ecosystem in future years if no further disruptions occur. Acceptable responses include, but are not limited to:

- The new stable ecosystem would probably continue in the area.
- It would probably remain unchanged for many years.
- It will remain a stable ecosystem.
- It would remain the same.
- It becomes a climax community/grassy field.

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

- Genetic information in body cells isn't passed on to offspring.
- The mutation isn't in sperm or egg cells.
- Mutations must be in gametes to be passed on to offspring.

Part C

- 56** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Amino acids are the building blocks of protein.
 - Amino acids are found in enzymes, which regulate chemical activity in complex organisms.
 - Amino acids are found in our bodies' muscle and organ tissue.
- 57** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- People would starve.
 - Farmers could not grow enough crops to feed the population.
 - The human population would decrease.
 - The food supply would decrease.
 - Human civilization in its current form could not exist.
 - Humans would have deficiencies in their diet.
 - Humans would be malnourished.
- 58** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- The factories produce useful products to help increase the food supply, but also produce pollutants.
 - The factories provide fertilizers for the production of more food, but disrupt the habitats of some organisms.
 - Fertilizers are useful for the growth of healthy plants, but can also be harmful if they wash off into lakes/waterways.
 - Fertilizers help plants grow, but could harm the environment.

Note: The student's response to the bulleted items in question 59–60 need *not* appear in the following order.

59 [1] Allow 1 credit for stating a hypothesis for the experiment. Acceptable responses include, but are not limited to:

- If bacteria are exposed to UV light, they will form fewer colonies than those not exposed.
- Longer exposure to UV light will limit bacterial growth.
- Exposure to UV light affects the growth of bacteria.
- If bacteria are exposed to UV light, they will not form colonies.
- Bacteria protected from UV light will produce more colonies.

Note: Do *not* allow credit for a hypothesis written in the form of a question.

60 [1] Allow 1 credit for stating whether the results of the experiment support or fail to support the student's hypothesis and supporting the answer. Acceptable responses include, but are not limited to:

- The experiment supports the hypothesis that longer exposure to UV light limits bacterial growth, since fewer colonies grew with longer exposure to UV light.
- Support, because more exposure to UV light resulted in fewer bacterial colonies.

Note: Allow credit only for an answer that is consistent with the student's response to question 59.

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

- More variation increases the chances that some members of the population will survive in a changing environment.
- Differences between offspring increase the likelihood that some individuals will have adaptations to their new environment.
- Variations provide raw material for natural selection when environments change.
- More variation increases the stability of the population.
- Without the variations, the population may not survive in a changing environment.

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

- More individuals with favorable traits usually survive, passing on those traits to the next generation.
- As a result of natural selection, the number of individuals with favorable traits increases.
- The fittest will survive, causing an increase in the frequency of favorable traits.

- 63** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Receptors receive messages sent by other cells.
 - They enable cells to respond appropriately.
- 64** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Receptor molecules have specific shapes that influence how they interact with other molecules.
 - The shape determines with which molecules they interact.
 - The shape of the receptor molecule and messenger molecule must match.
 - The shapes must match/fit together.
- 65** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- high levels of glucose in the blood/urine
 - The person might be diabetic.
 - Less glucose will go into the cells.
 - The blood glucose level will not be controlled.
- 66** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Offspring receive genetic information from each of two parents.
 - Each parent contributes half of the offspring's genetic material.
 - Recombination of genes occurs at fertilization.
 - may be due to mutations
 - meiosis and crossing over
- 67** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Fraternal twins arise from two fertilized eggs.
 - Identical twins are produced from one zygote/fertilized egg.
 - Identical twins come from the same fertilized egg.
- 68** [1] Allow 1 credit for *two* environmental factors. Acceptable responses include, but are not limited to:
- stress
 - pollutants
 - food
 - smoke/pesticides/alcohol/drugs
 - temperature

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

- Nutrients move across the placenta.
- diffusion across the placenta
- diffusion from the mother’s blood to the fetus

Note: Simply stating “through the umbilical cord” by itself is *not* an acceptable answer.

70 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- Pregnant women should have regular doctor visits.
- exercise during the pregnancy
- avoid alcohol/drugs

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

- The bacteria may not become resistant to the heaters.
- Antibiotics may have negative side effects.
- Heaters will act faster than the antibiotics.

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

- The mother had antibodies against the measles.
- The mother had been vaccinated against measles.
- The mother had measles when younger and still had immunity to measles.
- The mother is immune to the measles.
- The mother had a mutation that made her resistant.

Part D

73 MC on scoring key

74 MC on scoring key

75 MC on scoring key

76 MC on scoring key

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

- Trees and cacti do not usually grow in the same areas.
- Their food may only be available in certain areas on the island and the foods are different.
- Their foods do not grow in the same place since they are different.
- There is another resource one of the species needs that is not available where the other species lives.

78 [1] Allow 1 credit for circling “no” and supporting the answer. Acceptable responses include, but are not limited to:

- because his heart rate is below the range for his age group
- It falls in the range for people older than 14.
- His rate of 60 beats per minute puts him in the adult range.

79 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- During exercise, there is an increase in carbon dioxide, which causes the heart to beat faster.
- There is a feedback mechanism that causes the heart to beat faster in response to an increase in activity.
- When the heart beats faster, it increases the flow of oxygen-rich blood to the muscles.
- The heart pumping faster removes wastes faster.

80 [1] Allow 1 credit for correctly identifying species Z as being most closely related and supporting the answer. Acceptable responses include, but are not limited to:

- They have the same amino acid sequence.
- They have more DNA bases in common.

81 MC on scoring key

82 MC on scoring key

83 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- The starch solution would turn blue-black.
- The water in the beaker would be amber-colored.
- The liquid in the test tube would be blue-black.
- A color change would occur in the test tube.
- There would be a color change.

84 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- The restriction enzyme did not have a long enough time to cut the DNA sample.
- The DNA sample was not cut by this restriction enzyme.
- The restriction enzyme was denatured/did not work in the sample in lane 3.

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

- The experimental group should have been larger.
- The data should have been collected for a longer time period.
- A control group should have been included in the study.
- Data should have been collected during the last quarter of the game.
- Repeat the experiment.

The *Chart for Determining the Final Examination Score for the June 2018 Regents Examination in Living Environment* will be posted on the Department's web site at: <http://www.p12.nysed.gov/assessment/> on Wednesday, June 13, 2018. Conversion charts provided for previous administrations of the Regents Examination in Living Environment 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

June 2018 Living Environment

Standards	Question Numbers			
	Part A 1–30	Part B–1 31–43	Part B–2 44–55	Part C 56–72
Standard 1 — Analysis, Inquiry and Design				
Key Idea 1		31, 32		
Key Idea 2				
Key Idea 3		37		
Appendix A (Laboratory Checklist)		33	44, 45, 47	59, 60
Standard 4				
Key Idea 1	7, 8, 11, 14, 24, 29	35, 42, 43		56, 63
Key Idea 2	2, 4, 15, 17, 22			66, 67, 68
Key Idea 3		34	46, 48, 49, 55	61, 62
Key Idea 4	9, 13, 16, 18, 21, 23			69, 70
Key Idea 5	3, 12, 27	38, 39, 40, 41		64, 65, 71, 72
Key Idea 6	1, 6, 25, 30		50, 51, 52, 53, 54	
Key Idea 7	5, 10, 19, 20, 26, 28	36		57, 58

Part D 73–85	
Lab 1	75, 80, 84
Lab 2	78, 79, 85
Lab 3	74, 77, 81
Lab 5	73, 76, 82, 83