

FOR TEACHERS ONLY

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

LE

LIVING ENVIRONMENT

Wednesday, January 23, 2013 — 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.

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

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

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.

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, January 23, 2013. 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.

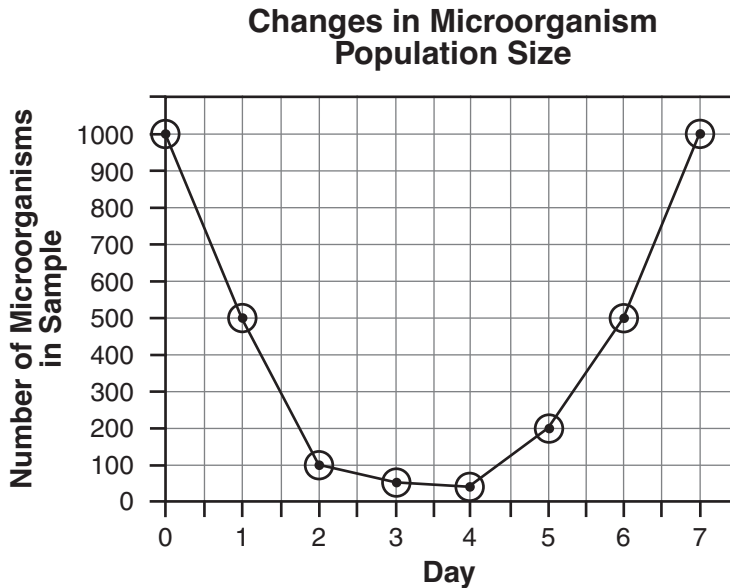
Because scale scores corresponding to raw scores in the conversion chart may change from one administration to another, it is crucial that, for each administration, the conversion chart provided for that administration be used to determine the student's final score.

Part B–2

44 [1] Allow 1 credit for marking an appropriate scale, without any breaks, on each labeled axis.

45 [1] Allow 1 credit for correctly plotting the data and connecting the points.

Example of a 2-credit graph for questions 44 and 45:



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

Do *not* assume 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 for plotting points 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:

- to maintain a constant volume in the container of experimental culture medium
- to lower the concentration of wastes
- so it did not add more microorganisms to it
- to replace nutrients that were removed

47 **MC on scoring key**

- 48 [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- More detail will be seen.
 - You might not see the entire specimen in the field of view.
 - The image might appear darker.

49 **MC on scoring key**

50 **MC on scoring key**

- 51 [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Disease killed large numbers of the moose.
 - The moose population overgrazed its habitat, resulting in starvation.
 - The moose population exceeded the carrying capacity of the environment.
 - overhunting
 - severe winter

Note: Do *not* allow credit for “the wolves ate more moose” *or* “they died.”

- 52 [1] Allow 1 credit for *B* and supporting the answer. Acceptable responses include, but are not limited to:
- In a food pyramid, the largest population of heterotrophs would be the herbivores and *B* is the largest group.
 - Most animals in an ecosystem are herbivores.
 - In most ecosystems, herbivores outnumber other heterotrophs.

- 53 [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- producers; capture energy from the Sun
 - producers; provide food for other organisms in the ecosystem
 - decomposers; recycle the remains of dead organisms
 - bacteria; recycle nutrients/raw materials
 - fungi; decompose dead organisms

54 [1] Allow 1 credit for amino acids *or* peptides.

- 55 [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- The shape of the protein could change.
 - The function of the protein could be different.
 - It might form a different protein.

Part C

56 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- Child *B* should be immune to both measles and polio.
- Child *B* will form antibodies against both diseases.
- Child *B* will not get measles or polio.

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

System:

- Immune system

Response:

- make antibodies
- increase white blood cell production
- produces cells that engulf the virus/pathogen

Note: The student's response to the bulleted items in question 58–59 need *not* appear in the following order.

58 [1] Allow 1 credit for stating *one* role this nutrient plays in the body. Acceptable responses include, but are not limited to:

- Carbohydrates are a source of energy. They can be used to produce the ATP needed for carrying out body activities.
- Proteins are necessary for growth and repair.
- Minerals are needed for strong bones and teeth.

59 [1] Allow 1 credit for describing, using *one* specific example, how a *decrease* in this nutrient can alter homeostasis. Acceptable responses include, but are not limited to:

- Decreased levels of carbohydrates might result in fatigue/less energy.
- Lack of protein in the diet might lead to muscle loss/enzyme deficiency.
- Lack of minerals might cause loss of bone density.

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

- If sucrose (*or glucose or fructose*) is the best sugar, then it will result in the greatest amount of carbon dioxide being produced.
- When yeast and sucrose (*or glucose or fructose*) are combined in a container with a balloon over it, the balloon will inflate the most.
- If sucrose (*or glucose or fructose*) is the sugar used, the loaf of bread produced will be the biggest.

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

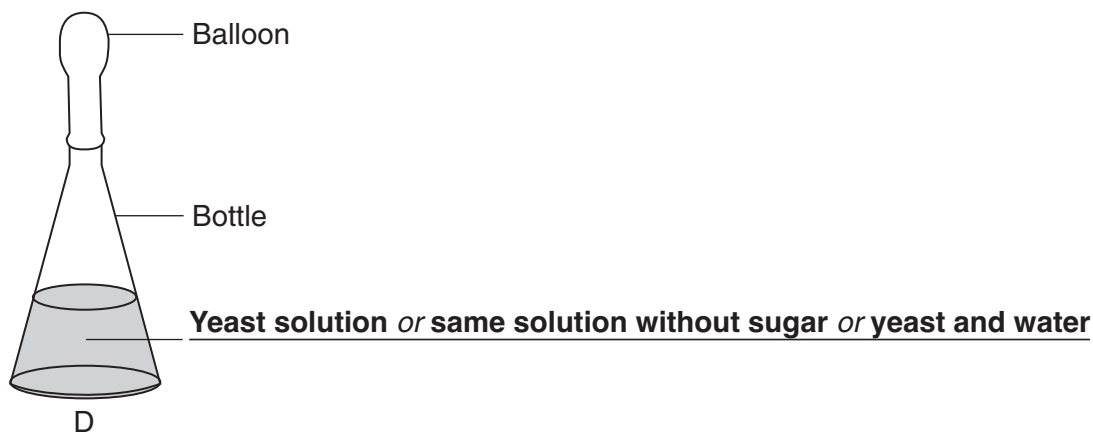
61 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- balloon size/circumference
- amount of carbon dioxide in the balloon

Note: The type of data must be measurable. Allow credit for an answer that is consistent with the student's hypothesis.

62 [1] Allow 1 credit for writing the correct contents of bottle *D*.

Example of a 1-credit response:



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

- Yeast uses sugar for respiration.
- The type of sugar used will make a difference.
- When mixed in the bread dough, the yeast will undergo respiration the same as it does in the bottle.
- The sugar that results in the greatest amount of carbon dioxide production in the experiment will produce the biggest loaf of bread.
- It is the sugar that influences the size of the loaf of bread.
- Changing the kind of sugar would make a greater difference than changing the kind of flour.

- 64** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Increased plant growth might block sunlight from penetrating the water, killing off other plant species.
 - Increased plant growth could disrupt the food chain by blocking light to the ecosystem.
 - There will be a change (increased/decreased) in the oxygen supply for fish.
 - There will be a change (decreased/increased) in the food supply for herbivores.
 - can result in more decaying material causing the lake to fill in
 - Excessive plant growth can limit animal movement/alter habitat.
- 65** [1] Allow 1 credit for A and for supporting the answer. Acceptable responses include, but are not limited to:
- The diagram shows the Sun and living things.
 - There are both biotic and abiotic factors shown in diagram A.
 - Diagram A includes the Sun and raw materials.
 - There are no abiotic factors in food web B.
 - Diagram B does not show the original source of energy.
 - Diagram B is missing an energy source and raw materials from the soil.
- 66** [1] Allow 1 credit for stating what would most likely happen to *one* other population in this food web if all the squirrels and rabbits were suddenly killed by a viral disease and for supporting the answer. Acceptable responses include, but are not limited to:
- The fox/weasel/cougar population would decrease because of less food.
 - The oak trees would increase because there would be more acorns.
 - The deer population might increase due to less competition for available food.
 - The deer population might decrease due to greater predation by cougars.
 - There would be more competition among foxes/weasels/cougars because of a decrease in food.
- 67** [1] Allow 1 credit for stating what effect this drought could have on the grouse population and for supporting the answer. Acceptable responses include, but are not limited to:
- Lack of rain could cause plants to die off, decreasing the food available for the beetles, which would die off, causing the grouse population to also decrease.
- 68** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- If there are not enough berries, then the deer population can eat more acorns and Hickory nuts.
 - The deer have other food sources.

Note: The student's response to the bulleted items in question 69–72 need *not* appear in the following order.

69 [1] Allow 1 credit for stating the overall relationship between time and carbon dioxide levels. Acceptable responses include, but are not limited to:

- As time increased, the levels of carbon dioxide increased.
- As time went by, the amount of carbon dioxide increased.
- Carbon dioxide production fluctuated with the seasons.

70 [1] Allow 1 credit for stating *one* possible cause for the overall change in the carbon dioxide levels shown in the graph. Acceptable responses include, but are not limited to:

- increase in human population
- fewer photosynthetic organisms
- deforestation
- increased use of fossil fuels
- increased volcanic activity

Note: Do *not* accept just “pollution” without a source or explanation.

71 [1] Allow 1 credit for identifying the biological process that might account for the decreases in carbon dioxide levels. Acceptable responses include, but are not limited to:

- photosynthesis
- autotrophic nutrition

72 [1] Allow 1 credit for identifying *two* actions carried out by humans that could lower carbon dioxide levels. Acceptable responses include, but are not limited to:

- planting more trees
- reducing the use of fossil fuels
- car pool/use public transportation/reduce driving
- recycling
- using alternative energy sources

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:

- shredder
- sharp, curved beak

78 [1] Allow 1 credit for identifying *one* kind of bird that would show an immediate *decrease* in number if the flowering land plants were destroyed by an environmental change and for supporting the answer. Acceptable responses include, but are not limited to:

- hummingbirds—no flowers available to obtain nectar from
- sparrows—no seeds available for food
- birds with cracker beaks—no seeds available for food

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

- Each trial should have more students.
- The clothespins were of two different sizes.
- The time intervals for the two trials were unequal.
- The boys and girls should not have been in separate groups.

80 [1] Allow 1 credit for indicating plant *C* and for supporting the answer. Acceptable responses include, but are not limited to:

- *A* and *C* have the most bands in common.
- *A* and *C* have the same pigments.
- Only *A* and *C* have yellow, orange, and green.
- The same pigments moved the same distance in *A* and *C*.

81 MC on scoring key

82 MC on scoring key

83 [1] Allow 1 credit for circling 1, 3, and 8.

Note: All three differences must be circled to receive credit. Allow credit if the student circled the correct DNA sequences rather than just the number.

84 [1] Allow 1 credit for indicating the mRNA sequences for the DNA sequences indicated by the student for question 83.

Note: If additional mRNA sequences are filled in *all* must be correct to receive 1 credit.

85 [1] Allow 1 credit for indicating the amino acid coded for by each mRNA written for question 84.

Note: Allow credit based on the mRNA base sequence in question 84. If additional sequences are filled in, *all* must be correct to receive 1 credit.

Example of a 3-credit response for questions 83–85:

	DNA Sequences							
	①	2	③	4	5	6	7	⑧
Human Insulin	CCA	TAG	CAC	CTT	GTT	ACA	ACG	TGA
Cow Insulin	CCG	TAG	CAT	CTT	GTT	ACA	ACG	CGA

	Human Insulin							
	1	2	3	4	5	6	7	8
DNA Sequence	CCA	TAG	CAC	CTT	GTT	ACA	ACG	TGA
mRNA Sequence	GGU		GUG					ACU
Amino Acid	GLY		VAL					THR

	Cow Insulin							
	1	2	3	4	5	6	7	8
DNA Sequence	CCG	TAG	CAT	CTT	GTT	ACA	ACG	CGA
mRNA Sequence	GGC		GUA					GCU
Amino Acid	GLY		VAL					ALA

The *Chart for Determining the Final Examination Score for the January 2013 Regents Examination in Living Environment* will be posted on the Department's web site at: <http://www.p12.nysed.gov/assessment/> on Wednesday, January 23, 2013. 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

January 2013 Living Environment

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

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