

FOR TEACHERS ONLY

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

LE

LIVING ENVIRONMENT

Wednesday, June 21, 2006 — 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 3 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 <http://www.emsc.nysed.gov/osa/> and select the link "Examination 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			Part B-1	
1 2	11 2	21 3	31 2	38 4
2 2	12 4	22 3	32 3	39 1
3 3	13 1	23 1	33 1	40 2
4 3	14 2	24 2	34 3	41 1
5 1	15 4	25 4	35 4	42 4
6 2	16 3	26 4	36 1	43 2
7 1	17 2	27 3	37 2	
8 3	18 3	28 1		
9 1	19 1	29 3		
10 3	20 4	30 4		

LIVING ENVIRONMENT – *continued*

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*.

Use only *red* ink or *red* pencil in rating Regents papers. Do not attempt to *correct* the student's work by making insertions or changes of any kind.

Allow 1 credit for each correct response for multiple-choice questions.

On the detachable answer sheet for Part A and Part B–1, indicate by means of a checkmark each incorrect or omitted answer to multiple-choice questions. In the box provided in the upper right corner of the answer sheet, record the number of questions the student answered correctly for each of these parts.

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 all 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. In the student's examination booklet, record the number of credits earned for each answer in the box printed to the right of the answer lines or spaces for that question.

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.

Raters should enter the scores earned for Part A, Part B–1, Part B–2, Part C, and Part D on the appropriate lines in the box printed on the answer sheet and should add these 5 scores and enter the total in the box labeled "Total Raw Score." Then the student's raw score should be converted to a scaled score by using the conversion chart that will be posted on the Department's web site <http://www.emsc.nysed.gov/osa/> on Wednesday, June 21, 2006. The student's scaled score should be entered in the box labeled "Final Score" on the student's answer sheet. The scaled score is the student's final examination score.

All student answer papers that receive a scaled score of 60 through 64 **must** be scored a second time. For the second scoring, a different committee of teachers may score the student's paper or the original committee may score the paper, except that no teacher may score the same open-ended questions that he/she scored in the first rating of the paper. The school principal is responsible for assuring that the student's final examination score is based on a fair, accurate, and reliable scoring of the student's answer paper.

Because scaled scores corresponding to raw scores in the conversion chart may change from one examination 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.

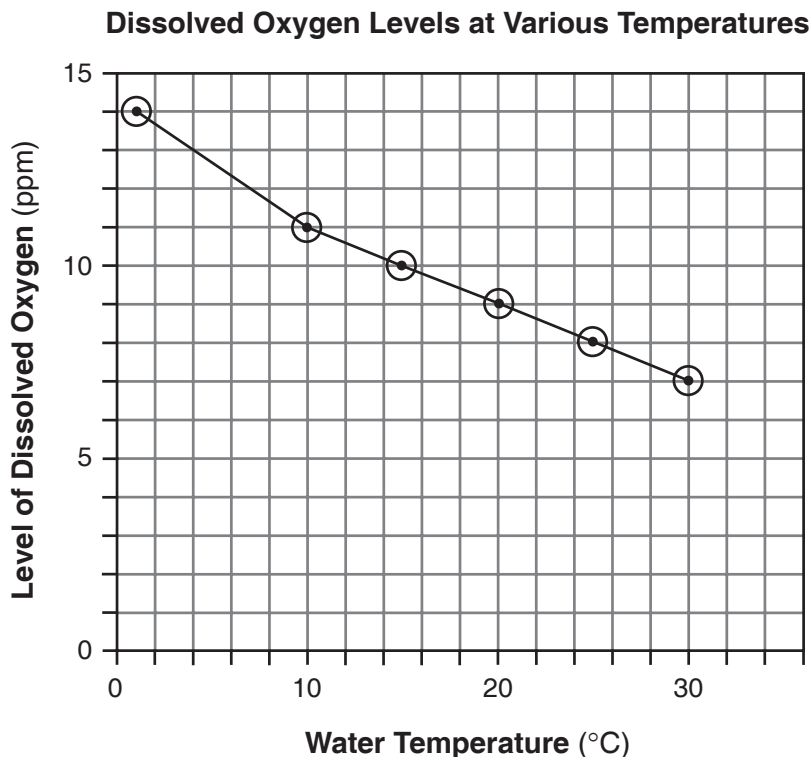
Part B–2

44 Allow 1 credit for marking an appropriate scale on each labeled axis.

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

Note: Allow credit if the points are plotted correctly but not circled. Do *not* allow credit for plotting points that are not in the data table, e.g., (0,0).

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



46 Allow 1 credit for indicating that the approximate dissolved oxygen level would be 6 ppm (± 0.5 ppm) or an answer that is consistent with the student's graph.

47 Allow 1 credit for stating the relationship between the level of dissolved oxygen and water temperature. Acceptable responses include, but are not limited to:

- As the water temperature rises, the level of dissolved oxygen decreases.
- As the water temperature decreases, the level of dissolved oxygen increases.

LIVING ENVIRONMENT – *continued*

48 Allow 1 credit for identifying *one* physical or biological process taking place within the river, other than temperature change, that would affect the level of dissolved oxygen and stating whether the process identified would increase or decrease the level of dissolved oxygen. Acceptable responses include, but are not limited to:

- Photosynthesis would increase the level of dissolved oxygen.
- Respiration would decrease the level of dissolved oxygen.
- Decomposition would decrease the level of dissolved oxygen.
- Turbulence of the river water will increase the level of dissolved oxygen.

49 3

50 1

51 Allow 1 credit for explaining how selective breeding is being used to try to produce commercial peanuts that will not cause allergic reactions in people. Acceptable responses include, but are not limited to:

- Varieties of peanuts that are low in the allergens will be crossed with commercial types.
- Varieties of peanuts that are free of the allergens will be crossed with commercial types.
- A variety of peanut that has 80% less of one of the allergens will be crossed with commercial types.

52 Allow 1 credit for identifying *one* type of organism that carries out process 1. Acceptable responses include, but are not limited to:

- plants
- autotroph
- producer
- trees

53 Allow 1 credit for explaining why process 2 is essential in humans. Acceptable responses include, but are not limited to:

- to make food molecules small enough to be transported (or diffused)
- so that energy can be released

54 Allow 1 credit for identifying process 3. Acceptable responses include, but are not limited to:

- respiration

55 Allow 1 credit for identifying what letter X represents. Acceptable responses include, but are not limited to:

- ATP
- energy

Part C

56 Allow a maximum of 3 credits for providing a biological explanation for the loss of effectiveness of the insecticides, allocated as follows:

- Allow 1 credit for identifying the original event that resulted in the evolution of insecticide resistance in some insects. Acceptable responses include, but are not limited to:
 - A mutation (or genetic change) probably occurred that led to the resistance to the insecticide.

Note: Do *not* accept that the insects became “immune” to the insecticide.

- Allow 1 credit for explaining why the percentage of resistant insects in the population has increased. Acceptable responses include, but are not limited to:
 - The percentage of resistant insects in the population has increased over the years because they survived when the insecticide was used, and were then able to reproduce and pass on the resistance.

Note: Do *not* allow credit for simply stating that they survived.

- Allow 1 credit for describing *one* alternative form of insect control, other than using a different insecticide, that fruit growers could use to protect their crops from insect attack. Acceptable responses include, but are not limited to:
 - release natural predators of the insects
 - the release of large numbers of sterile males of insect species that damage fruits
 - provide conditions that help predators of the insects live in the area
 - genetically engineer insect-resistant plants

57 Allow a maximum of 5 credits for describing a controlled experiment using three experimental groups that could be used to determine the best concentration of salt solution in which to hatch brine shrimp eggs, allocated as follows:

- Allow 1 credit for describing how the control group and each of the three experimental groups will be different. Acceptable responses include, but are not limited to:
 - The control group will be in a 0% salt solution while the experimental groups will be in varying salt concentrations, such as 2%, 4%, and 6%.
 - The control group will be in normal seawater while the experimental groups will have different salt concentrations.

LIVING ENVIRONMENT – *continued*

- Allow a maximum of 2 credits, 1 credit for each of *two* conditions that must be kept constant in the control group and the experimental groups. Acceptable responses include, but are not limited to:
 - the number of brine shrimp eggs in each group
 - species of brine shrimp
 - the number of days observed
 - the temperature
 - the amount of liquid in each container
 - the size of each container
 - the type of container
- Allow 1 credit for indicating data that should be collected. Acceptable responses include, but are not limited to:
 - the total number of brine shrimp eggs hatched after a given time in each of the different salt concentrations
- Allow 1 credit for *one* example of experimental results that would indicate the best concentration of salt solution in which to hatch brine shrimp eggs. Acceptable responses include, but are not limited to:
 - the concentration of salt in which the greatest number of shrimp eggs hatched by the end of the experiment
 - The concentration in which brine shrimp eggs hatch soonest is best.

58 Allow a maximum of 2 credits, allocated as follows:

- Allow 1 credit for identifying the structure labeled *A* as the placenta.
- Allow 1 credit for explaining how the functioning of structure *A* is essential for the normal development of the fetus. Acceptable responses include, but are not limited to:
 - exchange surface for nutrients *or* wastes *or* O₂ between mother and fetus

59 Allow 1 credit for explaining why the consumption of alcoholic beverages by a pregnant woman is likely to be more harmful to her fetus than to herself. Acceptable responses include, but are not limited to:

- When the alcohol from the mother’s bloodstream enters the fetus, the relative amount is much greater due to the smaller size of the fetus.
- The fetus is still developing.

LIVING ENVIRONMENT – *continued*

- 60** Allow a maximum of 2 credits, 1 credit for each of *two* internal environmental factors that directly influence the rate of enzyme action. Acceptable responses include, but are not limited to:
- temperature
 - pH
 - concentration of enzyme
 - substrate
- 61** Allow 1 credit for explaining why changing the shape of an enzyme could affect the ability of the enzyme to function. Acceptable responses include, but are not limited to:
- If the shape changes, it will not fit with the same substrate.
 - The enzyme no longer fits with the molecules with which it interacted before.
 - Shape determines function.
- 62** Allow a maximum of 3 credits for describing a cause and an effect of deforestation and a way to lessen this effect, allocated as follows:
- Allow 1 credit for stating *one* reason deforestation is occurring. Acceptable responses include, but are not limited to:
 - There is a great demand for lumber for building new homes and other structures.
 - Forested areas are being cut down to allow for grazing areas for animals.
 - Allow 1 credit for stating *one* environmental problem that results from widespread deforestation. Acceptable responses include, but are not limited to:
 - Habitats are lost.
 - When many trees are cut down, the carbon dioxide they would normally use remains in the atmosphere (and may intensify the process of global warming).
 - Deforestation promotes erosion.
 - Allow 1 credit for stating *one* way to lessen the effects of deforestation other than planting trees. Acceptable responses include, but are not limited to:
 - protect present forested areas
 - allow succession to take place on deforested land
 - reduce the amount of CO₂ that is released to the atmosphere
 - recycle paper
 - cut down fewer trees

Part D

63 Allow 1 credit for filling in the missing mRNA base sequence for species *B*:

ACG ACG UAU GUC CAU

64 Allow 1 credit for filling in the missing amino acid sequence for species *C*:

GLY THR TYR VAL GLN

65 Allow 1 credit for stating which *two* plant species are most closely related and supporting the answer. Acceptable responses include, but are not limited to:

— species *C* and *D* because the amino acid sequences are identical

Note: Allow credit for an answer that is consistent with the student’s response to question 64.

66 1

67 Allow 1 credit for correctly completing the data table:

Pulse Rate After Activity

Trial	20-Second Pulse Counts	Pulse/Min
1	23	69
2	26	78
3	21	63
Average		70

68 Allow 1 credit for indicating that the student would need the resting pulse rate for comparison.

LIVING ENVIRONMENT – *concluded*

69 2

70 3

71 1

72 2

73 3

74 Allow a maximum of 2 credits for describing how an indicator can be used to determine if starch diffuses through the membrane into the beaker.

Example of a 2-credit response:

Add starch indicator solution to the water in the beaker. If the indicator solution changes color, then starch is present (no color change, no starch).

The *Chart for Determining the Final Examination Score for the June 2006 Regents Examination in Living Environment* will be posted on the Department's web site <http://www.emsc.nysed.gov/osa> on Wednesday, June 21, 2006. 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.

Submitting 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 www.emsc.nysed.gov/osa/exameval.
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 2006 Living Environment

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

Part D 63–74	
Lab 1	63,64,65,66
Lab 2	67,68
Lab 3	69,70,71
Lab 5	72,73,74