

FOR TEACHERS ONLY

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

LE

LIVING ENVIRONMENT

Friday, August 17, 2012 — 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/apda/> 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 1	17 2	25 4
2 3	10 2	18 1	26 2
3 3	11 1	19 3	27 1
4 1	12 2	20 2	28 4
5 1	13 2	21 3	29 1
6 2	14 2	22 4	30 4
7 4	15 4	23 2	
8 3	16 4	24 3	
Part B-1			
31 1	35 1	39 1	43 1
32 4	36 4	40 1	
33 4	37 2	41 4	
34 1	38 4	42 3	
Part B-2			
47 2	49 4	50 2	
Part D			
73 3	75 4	81 3	
74 2	76 4	82 3	

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.

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/apda/> on Friday, August 17, 2012. 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 the data table.

Example of a 1-credit response for question 44:

**Height of Tomato Plants
After Three Weeks**

Height of Plant (cm)	Number of Tomato Plants
3	4
5	3
7	2
9	1

45 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- Some may have received more water/sunlight/nutrients.
- differences in genes
- mutations
- different types of tomato plants

46 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- They have different nutritional requirements.
- A is an autotroph and C is a heterotroph.
- They have at least one very different characteristic.

47 **MC on scoring key**

48 [1] Allow 1 credit for describing the impact of the proposed action on the forest ecosystems in these areas if the bears are eliminated and supporting the answer. Acceptable responses include, but are not limited to:

- The forest ecosystem would not get the nitrogen, sulfur, carbon, and phosphorus it needs, since grizzly bears leave these elements.
- The plants and animals that require the nutrients from the salmon carcasses would not be able to survive.
- The forest ecosystem would change without nutrients from decaying fish.

49 MC on scoring key

50 MC on scoring key

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

- White blood cells engulf bacteria that might have entered the wound.
- White blood cells produce antibodies that attack pathogens that may have entered the cut.
- They fight infection.

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

- These changes could result in an environment not suitable for some species.
- Extinction can result when a species lacks sufficient variation to survive in a changing environment.
- A change could result in less food for the species.

53 [1] Allow 1 credit for carbon dioxide *and* water.

54 [1] Allow 1 credit for ATP.

55 [1] Allow 1 credit for ribosome.

Part C

Note: The student's responses to the bulleted items in question 56–60 need *not* appear in the following order.

56 [1] Allow 1 credit for stating the hypothesis the experiment would test. Acceptable responses include, but are not limited to:

- If poison ivy grows in a place with a higher than normal concentration of carbon dioxide, then it will grow taller.
- In high concentrations of carbon dioxide, poison ivy will grow faster.
- Large concentrations of carbon dioxide will cause poison ivy to produce more urushiol.
- Different concentrations of carbon dioxide will affect the growth rate of poison ivy plants.

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

57 [1] Allow 1 credit for stating *one* way the control group should be treated differently from the experimental group. Acceptable responses include, but are not limited to:

- The experimental group would be exposed to a higher than normal concentration of carbon dioxide. The control group would be exposed to the same level as before (normal level).
- The control group would have plants growing at normal carbon dioxide level.
- The experimental group would have plants growing at a higher carbon dioxide level.

Note: Do *not* allow credit for the control receiving no carbon dioxide.

58 [1] Allow 1 credit for identifying *two* conditions that should be kept the same in both the control and the experimental groups. Acceptable responses include, but are not limited to:

- The soil should be the same.
- amount of water is the same
- same species of plant used
- The length of exposure to daylight should be the same.
- the initial size of plants

59 [1] Allow 1 credit for describing the type of data to be collected. Acceptable responses include, but are not limited to:

- heights of plants
- average number of plant leaves
- total mass of plants
- size of leaves on the plants
- amount of urushiol produced

Note: Allow credit for an answer consistent with the student's hypothesis for question 56. The type of data must be measurable and must relate to the student's hypothesis for question 56.

- 60** [1] Allow 1 credit for identifying *one* safety precaution that should be taken during the experiment and explaining why it is necessary. Acceptable responses include, but are not limited to:
- Wear gloves to avoid exposure to the oil (urushiol).
 - Wear goggles to protect your eyes from the oil.
 - Avoid direct contact with poison ivy to avoid getting a rash.
- 61** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Other animals might be poisoned.
 - Beneficial organisms might be destroyed.
 - The poisons might be harmful to people.
- 62** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Plants provide food for native consumers.
 - Fish hide among plants to avoid predators.
 - The marshland food web might be altered.
 - decreased biodiversity
- 63** [1] Allow 1 credit for *two* acceptable responses. Acceptable responses include, but are not limited to:
- It will keep them from getting a disease.
 - It will keep them from getting eaten.
 - It protects them from pathogens.
 - It will give them a competitive advantage.
 - It keeps other plants from growing nearby.
- 64** [1] Allow 1 credit for predicting what would happen to the size of the population of these plants if other plants in the area began releasing similar chemicals and supporting the answer. Acceptable responses include, but are not limited to:
- The chemicals from other plants would harm this species, so its numbers will decline.
 - The plant population will decrease, since the chemicals might make the other species more competitive.
 - The population size might not change because the chemical may affect only bacteria or fungi.
 - The population would increase because they would all be releasing chemicals that kill pathogens.

- 65** [1] Allow 1 credit for predicting what would happen to the herbivore population if many plants in the area made protective chemicals and supporting the answer. Acceptable responses include, but are not limited to:
- Herbivores will increase if more plants are protected from pathogens.
 - The herbivore population might decline if they have no food.
 - The herbivores will have less food, so they will migrate to another area.

- 66** [1] Allow 1 credit for predicting *one* way the carnivores in the area could be affected by the production of protective chemicals by plants and supporting the answer. Acceptable responses include, but are not limited to:
- The carnivores will increase if there are more herbivores.
 - The carnivore population would probably decline because their food source would probably decline.
 - The carnivores might migrate to a different area where more food is available.

Note: The student’s response to the bulleted items in question 67–70 need *not* appear in the following order.

- 67** [1] Allow 1 credit for a description of what a vaccine is. Acceptable responses include, but are not limited to:
- a substance injected to stimulate the immune system to produce antibodies
 - A vaccine contains a dead/weakened pathogen that stimulates an immune response.
 - a substance that is administered that contains antigens
 - It has a small piece of the virus/viral coat, which causes the formation of antibodies.

Note: Do *not* accept a response that indicates that a vaccine contains “a little bit” of the disease *or* “a small amount” of the virus.

- 68** [1] Allow 1 credit for explaining why one group had a placebo sprayed into their nostrils before exposure to the virus. Acceptable responses include, but are not limited to:
- The group that received the placebo was the control group.
 - to see if the vaccine makes a difference

- 69 [1] Allow 1 credit for explaining why scientists used monkeys to test the SARS vaccine. Acceptable responses include, but are not limited to:
- Scientists used monkeys to test the vaccine because of their biological similarity to humans.
 - Monkeys are affected by the SARS virus, also.
 - There are stricter regulations regarding testing on humans, that must be followed.
- 70 [1] Allow 1 credit for stating what could be done to verify the results. Acceptable responses include, but are not limited to:
- researcher could repeat the experiment
 - use a larger sample size
 - verify blood samples were not contaminated
 - check that equipment is working properly
- 71 [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- acid rain
 - global warming
 - smog
 - high particulate concentration
 - increased carbon dioxide

Note: Do *not* allow credit for pollution.

- 72 [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Group: Industry
- could reduce the amount of carbon dioxide or other pollutants it puts into the air
 - could add scrubbers to their smokestacks
- Group: Environmental agencies
- could enforce the laws that limit the kinds and amounts of specific pollutants
 - could fine companies and individuals that are not within the legal levels
 - could propose new legislation to further reduce air pollution
- Group: Health professionals
- could point out the dangers associated with air pollution/smog
 - could motivate people to modify their activities that reduce air quality
- Group: Community groups
- could lobby for legislation that regulates the release of specific pollutants
 - could encourage politicians to pass laws that regulate the amounts of specific air pollutants that can be released
 - could organize boycotts of companies that pollute the air
 - could run recycling programs

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:

- electrophoresis
- gel electrophoresis
- DNA fingerprinting

78 [1] Allow 1 credit for correctly filling in the missing mRNA base sequences for species B and C.

Note: Allow 1 credit only if *all four* sequences are correct.

79 [1] Allow 1 credit for correctly filling in the missing amino acid base sequences for species A and B.

Note: Allow 1 credit only if *all four* sequences are correct.

Example of a 2-credit table for questions 78 and 79:

Species A	DNA base sequence	GAC	TGA	CTC	CAC	TGA
	mRNA base sequence	CUG	ACU	GAG	GUG	ACU
	amino acid sequence	LEU	THR	<u>GLU</u>	VAL	<u>THR</u>
Species B	DNA base sequence	GAC	AGA	CTT	CAC	TGA
	mRNA base sequence	<u>CUG</u>	UCU	GAA	<u>GUG</u>	ACU
	amino acid sequence	LEU	<u>SER</u>	<u>GLU</u>	VAL	THR
Species C	DNA base sequence	GAC	TGC	CAC	CTC	AGA
	mRNA base sequence	CUG	<u>ACG</u>	GUG	<u>GAG</u>	UCU
	amino acid sequence	LEU	THR	VAL	GLU	SER

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

- The amino acid ARG will be substituted for SER.
- The shape of the protein might change.
- The protein might not work.

81 **MC on scoring key**

82 **MC on scoring key**

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

- diffusion
- water diffused
- osmosis
- passive transport

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

- Organ: lungs
- Substance: oxygen

- Organ: small intestine
- Substance: digested food

- Organ: large intestine
- Substance: water

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

- molecules of substance too large
- molecule is charged

The *Chart for Determining the Final Examination Score for the August 2012 Regents Examination in Living Environment* will be posted on the Department's web site at: <http://www.p12.nysed.gov/apda/> on Friday, August 17, 2012. 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

August 2012 Living Environment

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

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