

# FOR TEACHERS ONLY

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

# LE

## LIVING ENVIRONMENT

Wednesday, August 14, 2013 — 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.

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

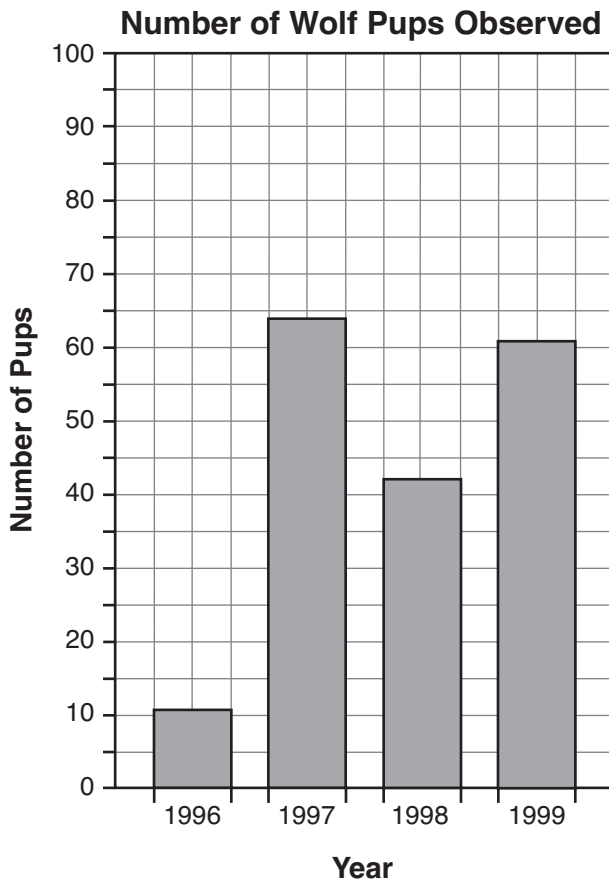
Because scale scores corresponding to raw scores in the conversion chart may change from one administration to another, it is crucial that for each administration, the conversion chart provided for that administration be used to determine the student's final score.

**Part B–2**

44 [1] Allow 1 credit for marking an appropriate scale, without any breaks, on the axis labeled “Number of Pups.”

45 [1] Allow 1 credit for constructing vertical bars to represent the data.

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



**Note:** Allow credit if the correct data are clearly represented, even if the bars are *not* shaded. 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.

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

- Wolves will not go extinct.
- increase biodiversity
- control the number of prey
- increase stability in the ecosystem
- The wolf population increases.

**47 MC on scoring key**

**48** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- Available food limited the population of wolves.
- Weather conditions were harsh.
- The prey animals migrated out of the area.
- Some wolves left the Yellowstone area.
- Some wolves died from disease.
- They had exceeded carrying capacity.

**49 MC on scoring key**

**50 MC on scoring key**

**51** [1] Allow 1 credit for stating if a person with a BMI of 27 is at risk for diseases such as diabetes or high blood pressure and supporting the answer. Acceptable responses include, but are not limited to:

- The BMI indicates the person is overweight and is therefore at risk for these diseases.
- Yes, there is a slight risk because the BMI places the person in the overweight category, but not in the obese range.

**52** [1] Allow 1 credit for lose weight *or* lose.

**53** [1] Allow 1 credit for 40 *or* -40.

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

- create jobs
- increased revenue for the state
- increased supply of U.S. oil
- decreased reliance on foreign oil

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

- If oil is spilled, it can kill many plants and animals.
- The pollution from an oil spill could be long lasting.
- Spilling oil could cause harm by coating the feathers of birds and the fur of animals.
- Trucks and other needed equipment could damage habitats.
- Leaking oil could harm wildlife.
- Noise from the oil rig may scare animals away, resulting in the loss of biodiversity.

## Part C

**Note:** The student's responses to the bulleted items in question 56–58 need *not* appear in the following order.

**56** [1] Allow 1 credit for stating *one* specific benefit humans gain from fish farming. Acceptable responses include, but are not limited to:

- Fish farming provides a convenient source of food.
- inexpensive source of protein
- a source of food for a growing human population
- Decreased use of deep-sea vessels reduces the cost of fishing.

**57** [1] Allow 1 credit for stating how biodiversity may be reduced by fish farming and supporting the answer. Acceptable responses include, but are not limited to:

- Biodiversity is decreased because waste from fish farms may produce dead zones on the ocean floor.
- It is reduced because pollution from fish farms may destroy the habitats of other fish.
- The farms concentrate one species of fish in one area.

**58** [1] Allow 1 credit for describing the impact, other than a reduction in biodiversity, fish farming may have on natural ecosystems of coastal waters if no changes are made. Acceptable responses include, but are not limited to:

- Large quantities of wastes from fish farming pollute marine environments.
- Uneaten fish food may pollute marine environments.
- Beaches may become unusable.
- It may create a toxic “dead zone.”

**Note:** Do *not* accept just “pollution” without a description.

**59** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- The control group would be in normal lake water. The experimental groups would be kept in water with lower pHs.
- The control group would be kept in water from normal lakes.
- The control group would be kept in lake water not affected by acid rain.

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

- the type of fish eggs
- the number of fish eggs
- the temperature of the water
- the amount of oxygen in the water

- 61** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- the number of eggs that hatched in the experimental group compared to the number in the control group
  - the number of eggs that hatched
  - the time it took the eggs to hatch
  - the number of eggs that hatch in 24 hours

**Note:** The type of data must be measurable.

- 62** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Fewer eggs hatched in the lower pH levels.
  - It took longer for fish eggs to hatch in water that had a lower pH.
  - Fewer eggs hatched in the experimental group.

- 63** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- coordination
  - balance
  - walking
  - talking
  - swallowing

**Note:** Do *not* accept symptoms, i.e, “poor balance” *or* “difficulty walking.”

- 64** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- There is an excess of proteins in the cells of the brain and spinal cord.
  - There are abnormal levels of proteins in their nerve cells.

**Note:** The student's response to the bulleted items in question 65–68 need *not* appear in the following order.

- 65** [1] Allow 1 credit for explaining why an ecosystem requires a constant input of energy. Acceptable responses include, but are not limited to:
- Energy is always lost as it is transferred through the ecosystem.
  - Energy is continuously needed for metabolic processes.
  - It is needed so that autotrophs can make food.
- 66** [1] Allow 1 credit for explaining how organisms in group *B* obtain energy. Acceptable responses include, but are not limited to:
- Some group *B* animals eat group *A* plants.
  - Organisms in group *B* obtain energy from organisms in group *A* when they eat them.
  - Group *B* eats plants, fungi, and/or other animals.
  - The animals eat the plants.
  - They obtain energy from their food.
- 67** [1] Allow 1 credit for explaining the role of organisms in group *C* in the ecosystem. Acceptable responses include, but are not limited to:
- Organisms in group *C* break down dead organisms and return nutrients to the soil.
  - Group *C* returns raw materials to the ecosystem by decomposing dead organisms.
  - These organisms are decomposers who recycle nutrients in the ecosystem.
- 68** [1] Allow 1 credit for identifying the process used by *all three* groups of organisms to make energy available to their cells to carry out life functions as respiration *or* cellular respiration.

**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 identifying the scientific technique used to insert a gene from one organism into another. Acceptable responses include, but are not limited to:

- genetic engineering
- genetic recombination
- genetic manipulation
- gene splicing

**Note:** Do *not* allow credit for biotechnology. It is a field of science, not a technique.

**70** [1] Allow 1 credit for describing the function of a gene. Acceptable responses include, but are not limited to:

- a segment of DNA that codes for a protein
- Genes control traits.
- Genes carry genetic information from one generation to the next.

**71** [1] Allow 1 credit for identifying the type of molecule used to cut the gene from the DNA of an organism. Acceptable responses include, but are not limited to:

- enzyme
- restriction enzyme
- biological catalyst

**72** [1] Allow 1 credit for stating *one* benefit of this technique to humans. Acceptable responses include, but are not limited to:

- make medicines for humans
- increase the yield of crops
- use plants to produce vaccines
- produce needed hormones (chemicals) for humans
- introduce new traits/characteristics into an organism



**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 for filling in the missing mRNA sequences for species A.

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

**78 [1]** Allow 1 credit for filling in the missing amino acid sequences for species B.

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

**Example of a 2-credit response for questions 77 and 78:**

Species A	DNA base sequence	CCG	TGC	ATA	CAG	GTA
	mRNA base sequence	<b>GGC</b>	<b>ACG</b>	UAU	<b>GUC</b>	<b>CAU</b>
	amino acid sequence	GLY	THR	TYR	VAL	HIS
Species B	DNA base sequence	CCG	TGC	ATA	CAG	GTT
	mRNA base sequence	GGC	ACG	UAU	GUC	CAA
	amino acid sequence	GLY	<b>THR</b>	<b>TYR</b>	VAL	<b>GLN</b>

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

- The starch indicator diffused into the cell and reacted with the starch solution.
- The starch indicator reacted with the starch.
- The starch indicator diffused into the cell.

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

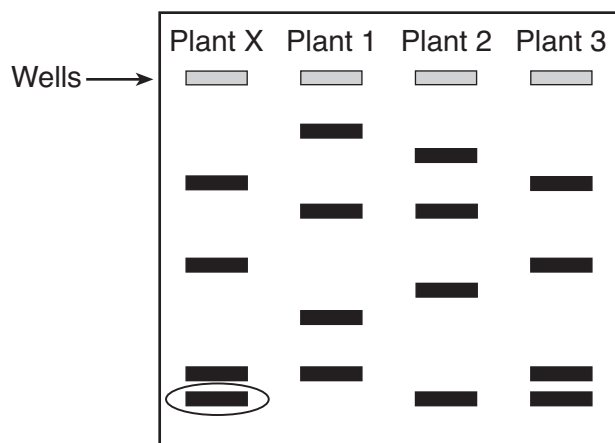
- Sugar would not be present.
- The protein enzyme would not digest the starch to sugar.

81 MC on scoring key

82 MC on scoring key

83 [1] Allow 1 credit for circling the band for plant X that would contain the smallest DNA fragments and supporting the answer.

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



- The smallest fragments travel the farthest/fastest in the gel.
- The smallest fragments are farthest from the well.

**Note:** Allow credit if the farthest bands in plants X, 2, and 3 are all circled. Do *not* allow credit if the last band in plant 1 is included. The student must circle the correct band *and* have correct support to receive 1 credit.

84 [1] Allow 1 credit for 3 and supporting the answer using information from the diagram. Acceptable responses include, but are not limited to:

- Plant X and plant 3 have the most similar banding pattern.
- Plant X and plant 3 have all bands in the same positions.

85 [1] Allow 1 credit for electrophoresis *or* gel electrophoresis *or* DNA fingerprinting.

**The *Chart for Determining the Final Examination Score for the August 2013 Regents Examination in Living Environment* will be posted on the Department's web site at: <http://www.p12.nysed.gov/assessment/> on Wednesday, August 14, 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

### August 2013 Living Environment

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

Part D 65–77	
Lab 1	77, 78, 83, 84, 85
Lab 2	73, 74, 75, 76
Lab 3	81, 82
Lab 5	79, 80