

# FOR TEACHERS ONLY

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

## LIVING ENVIRONMENT

Thursday, August 18, 2016 — 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 ..... 4 .....	9 ..... 1 .....	17 ..... 2 .....	25 ..... 4 .....
2 ..... 3 .....	10 ..... 3 .....	18 ..... 4 .....	26 ..... 1 .....
3 ..... 3 .....	11 ..... 1 .....	19 ..... 2 .....	27 ..... 4 .....
4 ..... 1 .....	12 ..... 1 .....	20 ..... 3 .....	28 ..... 2 .....
5 ..... 2 .....	13 ..... 3 .....	21 ..... 2 .....	29 ..... 2 .....
6 ..... 2 .....	14 ..... 3 .....	22 ..... 4 .....	30 ..... 3 .....
7 ..... 1 .....	15 ..... 2 .....	23 ..... 4 .....	
8 ..... 4 .....	16 ..... 3 .....	24 ..... 3 .....	
Part B-1			
31 ..... 1 .....	35 ..... 4 .....	39 ..... 1 .....	43 ..... 4 .....
32 ..... 1 .....	36 ..... 2 .....	40 ..... 1 .....	
33 ..... 2 .....	37 ..... 1 .....	41 ..... 2 .....	
34 ..... 3 .....	38 ..... 2 .....	42 ..... 3 .....	
Part B-2			
47 ..... 3 .....	49 ..... 4 .....	50 ..... 1 .....	
Part D			
73 ..... 4 .....	75 ..... 1 .....	81 ..... 3 .....	
74 ..... 4 .....	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. 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 Thursday, August 18, 2016. 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.

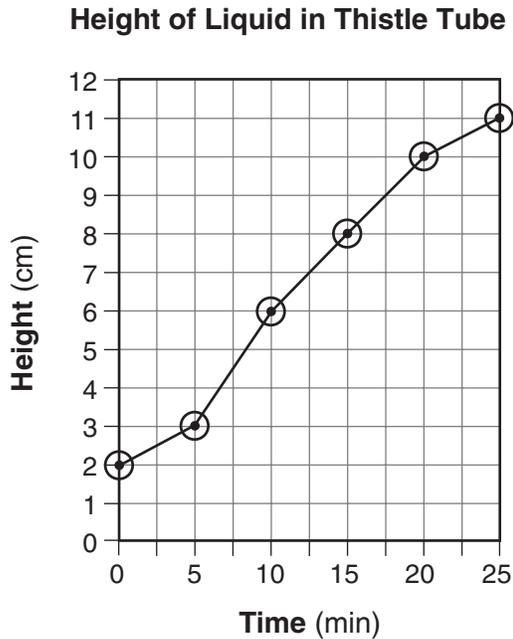
**Schools are not permitted to rescore any of the open-ended questions on this exam after each question has been rated once, regardless of the final exam score. Schools are required to ensure that the raw scores have been added correctly and that the resulting scale score has been determined accurately.**

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 in the data, on each labeled axis.
- 45 [1] Allow 1 credit for correctly plotting the data, connecting the points, and surrounding each point with a small circle.

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



**Note:** Allow credit if 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:
- Water diffused (moved) into the thistle tube.
  - Water went from an area of high concentration to an area of low concentration.
  - Osmosis took place.
  - Water diffused through the membrane.

47 MC on scoring key

- 48 [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Other species lack the receptors for the chemical.
  - The alarm chemicals are specific to the species.
  - Other species lack the ability to sense/recognize the chemical.

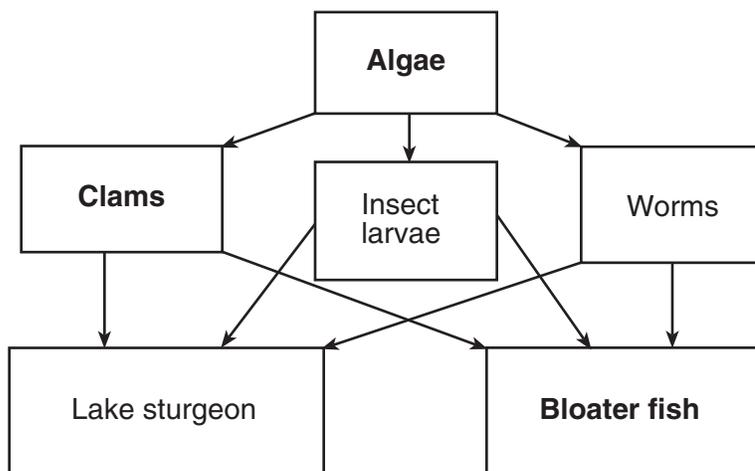
49 MC on scoring key

50 MC on scoring key

- 51 [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- The bacteria will produce the human hormone quickly.
  - to increase the production of insulin or some other hormone
  - The human hormone produced can be given to people who need it, and the number of allergic reactions will be reduced.
  - to get the bacteria to produce a human hormone

- 52 [1] Allow 1 credit for identifying *one* correct population and supporting the answer. Acceptable responses include, but are not limited to:
- Populations of insect larvae [*or* clams *or* worms] will decrease in size because they will be eaten by both lake sturgeon and bloater fish.
  - The bloater fish population will decrease in size because it will have to compete with the lake sturgeon for food resources.
  - clams because they are eaten by the sturgeon

- 53 [1] Allow 1 credit for:



**54** [1] Allow 1 credit for algae and supporting the answer. Acceptable responses include, but are not limited to:

- Algae, because there will be fewer organisms that feed on them.
- More algae will survive and reproduce because populations of insect larvae, clams, and worms that eat the algae will decrease in size because they will be eaten by both lake sturgeon and bloater fish.

**Note:** Allow credit for an answer that is consistent with the student's response to question 53.

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

- The arrows show the direction of energy movement from one organism to another.
- The arrows show the flow of energy.
- movement of nutrients through the food web
- what each organism feeds on

## Part C

- 56** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- too hard to track in natural habitat
  - The salamanders are easier to watch.
  - The conditions the salamanders are kept in can be better controlled.
  - to eliminate the possibility of them becoming an invasive species
  - to avoid predators
- 57** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- The sample size is small.
  - The environment is artificial.
  - The salamanders are not in their natural habitat.
  - The experiment was not repeated.
- 58** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- New species might compete with native species for limited resources.
  - Native species can have their space, light, and water taken away by invasive plants.
  - New plant species could also have nonnative insects/pathogens on them.
- 59** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Plants take in carbon dioxide to perform photosynthesis.
  - Plants use CO<sub>2</sub> to produce food.
  - Plants take in carbon dioxide.
- 60** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Carbon dioxide adds to the “Greenhouse Effect.”
  - Excessive carbon dioxide increases the temperature.
  - CO<sub>2</sub> has been associated with global warming/global climate change.
- 61** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Green roofs are expensive to install.
  - Green roofs need more maintenance.
  - Green roofs might be too heavy for the building structure.

- 62** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Bacteria exposed to x-ray radiation will show a greater number of mutations than bacteria exposed to natural light.
  - Bacteria exposed to x rays will show less DNA damage than bacteria exposed to natural light.
  - If bacteria are exposed to x rays, they will show more mutations than bacteria not exposed to x rays.
  - The DNA of bacteria exposed to x rays will change more than that of bacteria not exposed to x rays.
  - X rays affect bacterial DNA.

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

- 63** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- protects from every known influenza A virus
  - directly injects viral DNA
  - adds years of protection
  - It makes muscle cells produce hemagglutinin.
  - It causes muscle cells to make a protein found on the surface of all flu viruses.

- 64** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Your body responds by making antibodies that protect you from future infections.
  - There are antigens on the surface of the dead virus, which then trigger the body to produce antibodies specific to that antigen.
  - The body makes memory cells that can fight the virus in the future.

- 65** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- The access to fish is limited by the amount of ice cover.
  - They have to search for foods other than fish.
  - The ice cover might limit the number of organisms that are available for the eagles to eat.

- 66** [1] Allow 1 credit for stating what inference can be made about the percent ice cover at Croton Reservoir between January and February 2009 and supporting the answer. Acceptable responses include, but are not limited to:
- The ice cover was less in February because there were more eagles.
  - Since there were fewer eagles in January, there must have been more ice.

- 67** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Winter is ending, so the eagles returned to their summer nesting areas.
  - As winter ended, the eagles migrated away.
  - They fly freely between the sites, so their numbers would vary.
  - The number of visits by volunteers varied.
  - There were fewer visits in March than in January or February.
  - There were more late-season storms/ice in March than February.
- 68** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Winter roosts are protected under federal law and managed with a buffer zone to reduce human disturbance.
  - Humans might disturb the eagles.
- 69** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Their role is to convert inorganic (raw) materials into organic matter/food.
  - They capture radiant energy.
  - They serve as the producer in this food web/ecosystem.
  - They serve as food for fish.
  - produce oxygen
- 70** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- temperature: causes a change in currents
  - light: used by plants for photosynthesis
  - ocean currents: carry organisms from one reef to another
  - carbon dioxide: used by plants for photosynthesis
- 71** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- in order to maintain the food webs that exist there
  - because many organisms depend on them for food or shelter
  - to maintain biodiversity
  - keep oceans healthy
  - to prevent extinction of reef species
- 72** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- The fish larvae could repair/repopulate the damaged reefs.
  - The reef might become more stable.
  - They might keep the seaweed under control/eat the seaweed.
  - It would provide the fish larvae with food/shelter.
  - The fish larvae would have less competition.

## 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 stating *two* reasons. Acceptable responses include, but are not limited to:

- They have different beak structures.
- They might eat different types of plants.
- They might eat at different times of day or night.
- They might live in different areas of the island.

**78 [1]** Allow 1 credit for tree 2 and supporting the answer. Acceptable responses include, but are not limited to:

- Species *B* has enzyme *Y*, which is not present in either species *A* or *C*.
- Enzyme *W* (and/or *X*) is present in species *A* and *C*, but not in *B*.
- *A* and *C* have enzymes *W*, *X*, and *Z*, but *B* doesn't.
- *A* and *C* have 3 enzymes in common: *W*, *X*, and *Z*.
- *A* and *C* have more in common.

**79 [1]** Allow 1 credit for water.

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

- salt
- sugar
- seawater

**81 MC on scoring key**

## 82 MC on scoring key

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

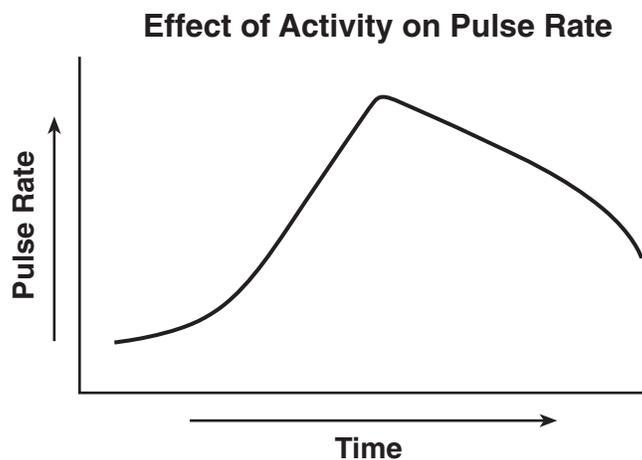
- C shows the transport of molecules from an area of low concentration to an area of higher concentration.
- The molecules are moving against the concentration gradient.

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

- They may have evolved in the same or similar environments, and these structures and traits were advantageous adaptations.
- They have two separate mutations that produce the same appearance.
- These structures might help them use similar food sources/adapt to their environment.
- The species inhabit similar environments.
- They occupy similar niches.
- natural selection
- convergent evolution

85 [1] Allow 1 credit.

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



**Note:** Allow credit for a graph that shows a gradual increase followed by a gradual decrease.

**The *Chart for Determining the Final Examination Score for the August 2016 Regents Examination in Living Environment* will be posted on the Department's web site at: <http://www.p12.nysed.gov/assessment/> on Thursday, August 18, 2016. 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 2016 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		39	47	
Key Idea 2				56, 57, 62
Key Idea 3		33, 36, 38	44, 45	
Appendix A (Laboratory Checklist)		32		
Standard 4				
Key Idea 1	1, 14	31, 40	46, 48, 52, 53, 54, 55	69
Key Idea 2	4, 5, 8, 11	35	49, 50, 51	
Key Idea 3	9, 13, 15, 16, 17, 18	37		
Key Idea 4	12, 19, 20, 21, 22			
Key Idea 5	2, 7, 10, 23, 24, 25	41, 42, 43		63, 64
Key Idea 6	26, 27, 28			65, 66, 67, 70, 71, 72
Key Idea 7	3, 6, 29, 30	34		58, 59, 60, 61, 68

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