

# FOR TEACHERS ONLY

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

## LIVING ENVIRONMENT

Wednesday, January 25, 2017 — 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 ..... 4 .....	9 ..... 3 .....	17 ..... 4 .....	25 ..... 3 .....
2 ..... 2 .....	10 ..... 1 .....	18 ..... 3 .....	26 ..... 2 .....
3 ..... 1 .....	11 ..... 3 .....	19 ..... 3 .....	27 ..... 2 .....
4 ..... 4 .....	12 ..... 3 .....	20 ..... 3 .....	28 ..... 2 .....
5 ..... 2 .....	13 ..... 4 .....	21 ..... 2 .....	29 ..... 4 .....
6 ..... 1 .....	14 ..... 3 .....	22 ..... 1 .....	30 ..... 2 .....
7 ..... 4 .....	15 ..... 3 .....	23 ..... 4 .....	
8 ..... 4 .....	16 ..... 3 .....	24 ..... 2 .....	
Part B-1			
31 ..... 1 .....	35 ..... 1 .....	39 ..... 3 .....	43 ..... 3 .....
32 ..... 1 .....	36 ..... 2 .....	40 ..... 2 .....	
33 ..... 1 .....	37 ..... 4 .....	41 ..... 2 .....	
34 ..... 2 .....	38 ..... 4 .....	42 ..... 1 .....	
Part B-2			
47 ..... 1 .....	49 ..... 3 .....	50 ..... 4 .....	
Part D			
73 ..... 4 .....	75 ..... 1 .....	81 ..... 2 .....	
74 ..... 2 .....	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, January 25, 2017. 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.

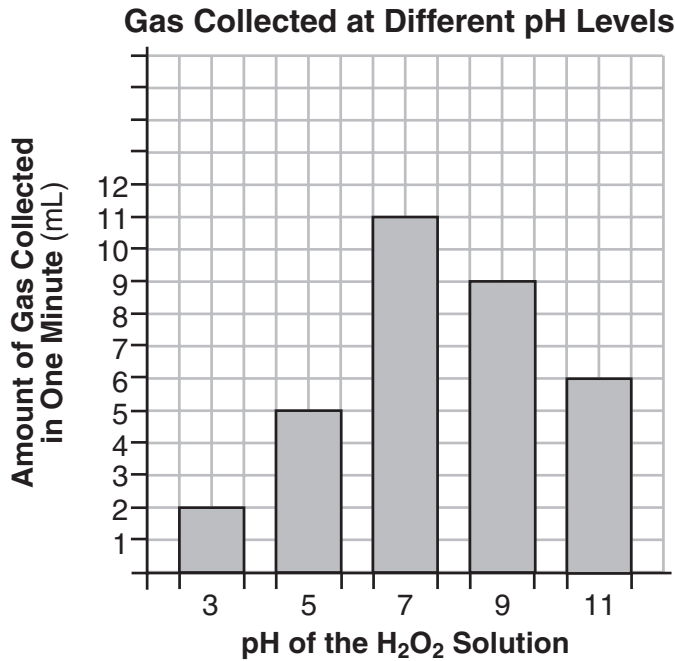
**Schools are not permitted to rescore any of the open-ended questions on this exam after each question has been rated once, regardless of the final exam score. Schools are required to ensure that the raw scores have been added correctly and that the resulting scale score has been determined accurately.**

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 the axis labeled Amount of Gas Produced (mL).
- 45 [1] Allow 1 credit for constructing vertical bars to represent the data.

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



**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:
- 10 mL (or any value between 9 and 11)

**Note:** Allow credit for an answer that is consistent with the student's graph.

### 47 MC on scoring key

- 48 [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- The mutations that cause some disorders are present in all the cells, including the reproductive cells, while the mutations that cause some other disorders only occur in body cells.
  - The mutations that occur in body cells/skin cells cannot be passed on to offspring.

## 49 MC on scoring key

## 50 MC on scoring key

- 51 [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- There would be a higher percentage of snakes that eat slugs.
  - The 20% of inland snakes who used slugs as food would survive and pass on the trait, but the others would likely die.
  - The percentage of snakes that could use slugs for food would increase in number.
  - The population would evolve into slug eaters over time.
  - Natural selection would favor the snakes who ate slugs and only the slug eaters would remain.

- 52 [1] Allow 1 credit for identifying the ovary/adrenal glands and stating *one* specific function of estrogen in a human female. Acceptable responses include, but are not limited to:
- regulate the reproductive system
  - Estrogen affects the development of the sex organs/sex cells.
  - Estrogen plays a role in the menstrual cycle.

**Note:** The student's response to the bulleted items in question 53–54 need *not* appear in the following order.

- 53 [1] Allow 1 credit for stating *one* similarity in the way relationships between organisms are shown in food chains and food webs. Acceptable responses include, but are not limited to:
- Both show which organisms feed on other organisms.
  - Both illustrate how energy flows from one organism to another through an ecosystem.

- 54 [1] Allow 1 credit for explaining why using a food chain is more limiting than using a food web to show relationships between organisms in an ecosystem. Acceptable responses include, but are not limited to:
- Food chains only show one specific series of feeding relationships.
  - Food webs show the feeding relationships more completely.
  - Food webs show more ways that energy can flow through the ecosystem.
  - Food webs show that organisms eat more than one type of food.

- 55 [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- respiration and photosynthesis
  - photosynthesis and aerobic respiration
  - photolysis and respiration

## Part C

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

**56** [1] Allow 1 credit for stating the hypothesis being tested in this investigation. Acceptable responses include, but are not limited to:

- Eating a diet with excessive amounts of fats and sugars has no connection with developing diabetes.
- Children who are diabetic have been eating more “super-sized” portions than those who are not.
- Children who are diabetic have been (or have not been) eating greater amounts of fats and sugars compared to those who are not.
- If children eat more fats and sugars, then they are more likely to be diabetic or have disorders.
- There is a relationship between diet and diabetes.

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

**57** [1] Allow 1 credit for identifying *one* survey response that was most likely used for organizing the children into two groups. Acceptable responses include, but are not limited to:

- The children were divided based on whether or not they were diabetic.
- The children were divided based on whether or not they ate “super-sized” portions.
- The children were divided based on different eating habits.

**58** [1] Allow 1 credit for stating what survey results would support the hypothesis stated above. Responses will vary based on the specific hypothesis stated and how the student proposed organizing the children into two groups. Acceptable responses include, but are not limited to:

If a connection between diabetes and diet was hypothesized:

- There would be data showing that more diabetic children ate more fats and sugars than children who were not diabetic.

If no connection was hypothesized:

- The data would show that about as many children with diabetes would have eaten more fats and sugars as children who were not diabetic.

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

Global warming/Global climate change

- Ride a bicycle or walk rather than drive car short distances.
- Use a car that runs efficiently.
- Put on a sweater rather than turning up the heat.
- Conserve fuel/electricity.
- Recycle rather than burn garbage.
- Reduce the burning of fossil fuels.

Air pollution

- use of solar panels
- scrubbers/precipitators on smoke stacks
- carpooling
- Reduce the burning of fossil fuels.

Deforestation

- Replace trees that are cut down.
- Support the development of green spaces in urban areas.

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

- If a pathogen kills some of the plants, it will destroy all of them since there will not be any plants with variations that could help them to survive.
- Cloning results in plants that are genetically identical. This can lead to the ecosystem being less stable and the loss of all the cloned plants to disease or pests.
- Plants that are genetically identical could die from the same disease.
- If something kills one plant, it may kill them all.

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

- Biofuels are renewable while fossil fuels are not.
- Biofuels reduce our dependence on oil.
- The use of biofuels does not deplete nonrenewable resources.
- They may lower greenhouse gases.
- It could reduce air pollution.

- 62** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Radioactive wastes can cause mutations that can be harmful to humans.
  - Radiation from them can cause cancer.
  - Their radiation can lead to death.
  - Radiation can lead to birth defects.
  - People will suffer from radiation poisoning.
- 63** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- They could use genetic engineering to produce algae that are able to collect more strontium.
  - gene manipulation
  - Modify their DNA to make them better at taking in the strontium.
  - Find organisms with the specific genes they need, cut them out, and then insert them into the algae.
- 64** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Their cells would lose water because the salt would cause water to diffuse out.
  - The high concentration of salt would cause the cells to lose water.
  - The salt water would cause water to diffuse out of the cell.
  - The cells would shrink/plasmolyze.
- 65** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Wolves ate the elk that fed on the trees. The trees supply shelter for birds and food for beavers.
  - An increase in wolves resulted in more trees growing for birds/beavers to use.
- 66** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Without federal protection, too many wolves would be killed.
  - They need 17,000 to benefit the Rocky Mountain region. Killing them would keep the number of wolves far below this.
  - The elk number would increase, killing too many trees.
  - may upset the ecosystem

**67** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- trees → elk → wolves
- willows → beavers → wolves
- aspens → elk → wolves
- shrubs → elk → humans
- trees → beavers → lynx

**Note:** Do *not* deduct credit if the Sun is included with the three organisms.

**68** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- The white blood cells will make antibodies against a specific antigen on the virus.
- The immune system recognizes the specific virus, and will make chemicals to fight the virus.
- Antibodies will be produced.
- The number of white blood cells will increase.
- White blood cells will engulf the virus.
- Body temperature increases.

**69** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- The vaccine contains only dead organisms or chemicals associated with pathogens.
- The contents of a vaccine are not functional pathogens/not able to reproduce and make you sick.
- The vaccine contains weakened pathogens that will not make people sick.

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

**70** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- The embryo should be placed in the mother’s uterus.
- To complete development, the embryo needs to be put into the mother’s uterus.
- Implant it into the mother.



- 71** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- The donor's cytoplasm contains mitochondria without the mutations.
  - The cytoplasm of the donor has healthy mitochondria.
  - The healthy mitochondria were there.

- 72** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- The mitochondria supply muscles with energy/ATP.
  - If the mitochondria are diseased, they can't supply the muscle with energy.
  - The mitochondria carry out cell respiration which supplies the muscles with energy.
  - They contain more mitochondria.
  - Muscles have a high energy requirement.

## 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:

- These frogs are important to maintaining biodiversity in the rainforest environment.
- They are prey for the birds and consume other organisms for food.
- The frogs could be a valuable source of medicines that might be developed from the toxins that they produce.
- The destruction of the habitat could have unintended consequences that could disrupt the entire food web.
- so the frog species does not become extinct

**78 [1]** Allow 1 credit. Acceptable responses include, but are not limited to:

- gel electrophoresis
- DNA analysis
- protein/molecular/biochemical analysis
- mate them to see if they can produce fertile offspring

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

- They have different body types.
- different sexes
- different ages
- different weights

**80 [1]** Allow 1 credit for starch and glucose.

**81 MC on scoring key**

**82 MC on scoring key**

- 83** [1] Allow 1 credit for stating the graph does not support the conclusion, and for supporting the answer. Acceptable responses include, but are not limited to:
- No, the results for shorter students were higher than for taller after walking.
  - No, the results in the graph are averages of all the students. Some taller students could have much lower rates or some shorter classmates could have much higher rates.
  - No, the sample size is too small to support this conclusion.
  - The data for walking do not support the conclusion.
- 84** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- As intensity of physical activity increases, pulse rate increases.
  - It is a direct relationship.
  - If the activity decreases, the pulse rate will decrease.
- 85** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Adaptation: fast flight speed
- to escape predators
- Adaptation: camouflage
- to hide from predators
- Adaptation: eyesight
- to locate food
- Adaptation: mating behavior (songs)
- to attract mates

**The *Chart for Determining the Final Examination Score for the January 2017 Regents Examination in Living Environment* will be posted on the Department's web site at: <http://www.p12.nysed.gov/assessment/> on Wednesday, January 25, 2017. 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 2017 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		33		
Key Idea 2		35		56, 57, 58
Key Idea 3		39, 41	44, 45, 46	
Appendix A (Laboratory Checklist)		40	47	
Standard 4				
Key Idea 1	13, 27, 28, 29	37, 38, 42, 43		64, 71, 72
Key Idea 2	17, 20, 21, 22, 24, 25		49	63
Key Idea 3	11, 12, 14	34	48, 50, 51	
Key Idea 4	1, 10, 16		52	70
Key Idea 5	3, 4, 5, 6, 7, 9, 30	36	55	68, 69
Key Idea 6	8, 18, 19, 23	31, 32	53, 54	67
Key Idea 7	2, 15, 26			59, 60, 61, 62, 65, 66

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