

# FOR TEACHERS ONLY

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

## LIVING ENVIRONMENT

Tuesday, January 21, 2020 — 1:15 to 4:15 p.m., only

### 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.

## 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*.

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 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. Do not attempt to correct the student’s work by making insertions or changes of any kind. 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 Tuesday, January 21, 2020. 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**

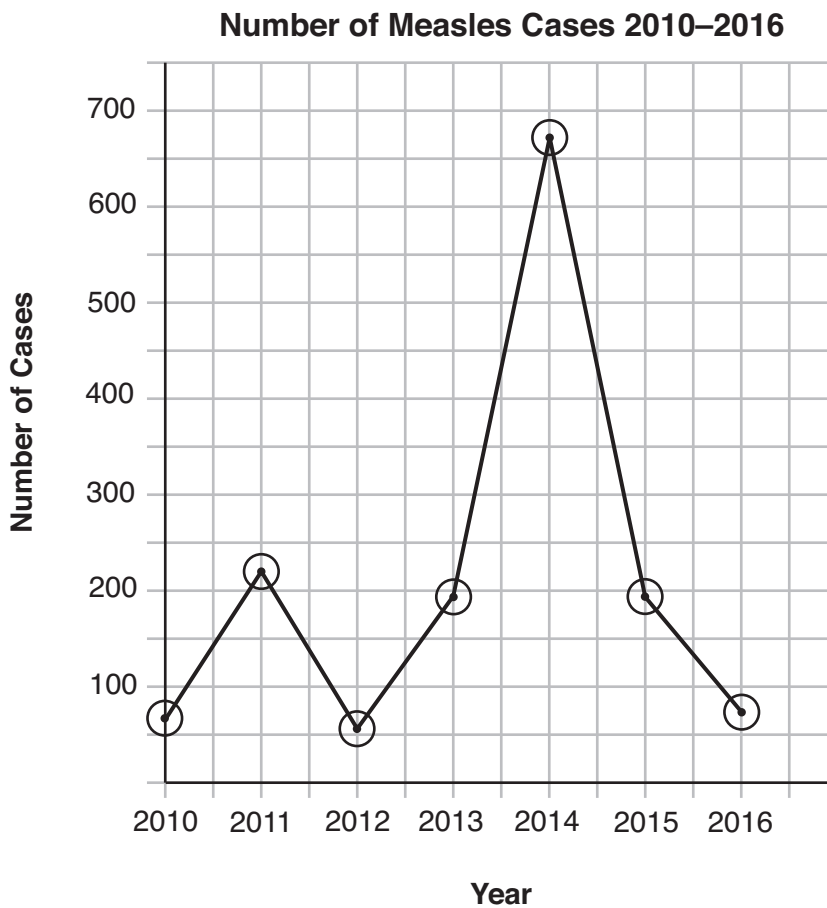
- 44 [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Sunlight is available for photosynthesis in shallow waters.
  - Light may not be available in deep waters.
  - Their food providers live in shallow water.
  - More food is available there.
  - Zooxanthellae are photosynthetic.

- 45 [1] Allow 1 credit for marking an appropriate scale on the grid provided, without any breaks in the data, on each labeled axis.

**Note:** Do *not* allow credit if the grid is altered to accommodate the scale.

- 46 [1] Allow 1 credit for correctly plotting the data and connecting the points and surrounding each point with a small circle.

**Example of a 2-credit graph for questions 45-46:**



**Note:** Allow credit if the points are plotted correctly, 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.

**47 MC on scoring key**

- 48** [1] Allow 1 credit for identifying Lake Erie and supporting the answer. Acceptable responses include, but are not limited to:
- The prey fish population increased between 2005 and 2007. There would be more food for predatory fish to consume in 2008 and 2009.
  - In all of the lakes but Lake Erie, the population of prey fish has decreased.
  - Lake Erie has the only population of prey fish that has increased over the past few years.

**49 MC on scoring key**

**50 MC on scoring key**

- 51** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- The scientists could take cells from the new variety of rice plant and clone a large number of plants.
  - cutting or rooting (asexual reproduction) of the new variety of rice plant
  - cloning/make cuttings to grow more
  - planting large fields/amounts of this particular rice/beneficial plant

- 52** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- The remaining energy is mostly given off/lost as heat.
  - It is given off as heat.
  - Some energy is used for metabolic processes.

- 53** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- It attracts males to the female.
  - The brighter glow attracts more males.
  - It warns off more predators.
  - The brightest female will lay more eggs.
  - Glowing warns predators it is not safe to eat.

- 54** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- The males won't find mates.
  - It interferes with reproduction.
  - Predators might not notice them.
  - It confuses predators.

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

- Their bodies contain a poison.
- Their light/glow warns off predators.
- Their light/glow warns predators that they are poisonous/not safe to eat.

## Part C

**56** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- People could carpool/use mass transportation/ride bikes.
- Regulate factory emissions.
- Use wind or solar power.
- Plant more trees.
- recycle

**Note:** Do *not* allow credit for issues mentioned in the passage, such as “stop burning fossil fuels.”

**57** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- Many species that live in our forests could see their numbers decline and possibly become extinct.
- CO<sub>2</sub>/methane levels will continue to increase.
- negative health effects on people or natural environments
- Sea levels may rise.
- decrease in biodiversity
- increase air/water pollution/acid rain

**Note:** Do *not* allow credit for just pollution.

**58** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- Climate change is affecting the planet as a whole.
- A change in one area alone would not have a significant effect on the effects of global warming.
- Air pollutants travel across national borders.
- Greenhouse gases move globally.

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

- The croton nut oil is renewable; the diesel fuel is not.
- The diesel fuel is a fossil fuel and is nonrenewable.
- The croton nut oil is less expensive than the diesel fuel.

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

- It maintains the habitat/biodiversity.
- Deforestation leads to reduced CO<sub>2</sub> uptake and contributes to global warming.
- There would be an increase in oxygen production.

- 61** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- The nuts are used almost entirely, and nothing is wasted.
  - No part of the nut is wasted.
  - The oil can be used as fuel and the remaining for other purposes.

- 62** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- If birds are exposed to DDT, then they will have eggs with weaker shells.
  - The use of DDT will have a negative effect on the health of human populations.
  - If more DDT is used to kill insects in a field/forest, then the number of birds living there will decrease.
  - The use of DDT in an area will lead to a decrease in the number of species living there.
  - If DDT is used, the number of DDT-resistant mosquitoes will increase.
  - The use of DDT will have little effect on the populations of birds living in the area.

**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:
- As more information became available, DDT changed from being considered a “miracle pesticide” to an environmental problem.
  - DDT was thought to be a good solution to the mosquito problem, but this changed as scientists observed more of the side effects of its use.
  - At first, DDT was thought to be good as a pesticide, but later was found to be harmful to birds/other animals.

- 64** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Cells require a supply of glucose to produce ATP.
  - Cells need glucose to carry out cellular respiration.
  - Cells need glucose to release energy/for energy/as a source of energy.
  - Glucose is needed to provide energy for cells.

- 65** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- The pancreas releases insulin, lowering blood sugar.
  - Insulin is released by the body.
  - Insulin is released and glucose enters cells.
  - Glucose/sugar moves into the cells.
  - The body stores glucose as glycogen.

- 66** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- The line would show increased blood glucose levels, which are not brought back down.
  - The line would stay at a high level and not come back down for a long time.
  - The line might go down at a slower rate.
  - The line would increase.
- 67** [1] Allow 1 credit for stating whether or not, based on the information provided, it would be valid to conclude that bananas supply more glucose than cookies and supporting the answer. Acceptable responses include, but are not limited to:
- No, it is not valid because only a cookie was tested.
  - No, it is not valid because there is no data for bananas.
  - No, bananas were not tested.
- Note:** The student's response to the bulleted items in question 68–71 need *not* appear in the following order.
- 68** [1] Allow 1 credit for stating why it would be harmful for a human mother's blood to pass across the placenta and into the fetus. Acceptable responses include, but are not limited to:
- The mother's blood may be interpreted as a pathogen and attacked by the fetus's immune system.
  - The mother's blood could contain chemicals and pathogens that could harm the fetus.
  - It could cause an immune response.
  - It could be a different blood type that could cause a reaction.
  - It could harm the fetus's organs.
- 69** [1] Allow 1 credit for describing how an artificial placenta would be of benefit to the lungs of premature infants. Acceptable responses include, but are not limited to:
- The lungs would be able to continue to mature, and the premature infant would not have to breathe on its own too soon.
  - The artificial placenta would perform the same processes as the natural placenta, allowing the lungs to continue to develop.
  - The artificial placenta would supply oxygen until lungs developed.
  - It would be of benefit because it prevents the accumulation of carbon dioxide.
  - It would help lessen complications associated with the mother's high blood pressure/diabetes.
- 70** [1] Allow 1 credit for explaining why the lambs' blood must be filtered as it circulates through the artificial placenta. Acceptable responses include, but are not limited to:
- The blood contains waste products that need to be removed.
  - Filtering removes wastes from the blood.



- 71** [1] Allow 1 credit for discussing why premature lambs were likely used as model organisms in this study rather than mice. Acceptable responses include, but are not limited to:
- Lambs are larger and more similar to human fetuses than mice are.
  - The development of a premature lamb is more similar to that of a human.
- 72** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- A lower rate of reproduction may not produce enough variation for this species to be able to survive an environmental change.
  - The reproductive rate may be too low to maintain survival of these organisms in a changing environment.

## 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 starch indicator/iodine or water.

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

- If the color of the liquid in the cell turns blue-black, the starch indicator passed into the cell.
- If the cell weighs more, water moved in.
- If the cell weighs less, water moved out.
- The cell would expand if water moved in.
- The cell would shrink if water moved out.
- If the starch had passed through, the water in the beaker would have changed color/turned blue-black.

79 [1] Allow 1 credit for identifying *one* finch from the diagram that would have a beak most similar to the new finch and supporting the answer. Acceptable responses include, but are not limited to:

- warbler finch, because it eats all animal food
- small tree finch, because it eats mainly animal food
- large tree finch, because it has a biting/grasping beak that would allow it to pick up and crush caterpillars and worms
- woodpecker finch, because it eats mainly animal food

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

- small seeds, because the tweezers have small prongs
- small seeds, because the tweezers aren't strong enough to hold the big seeds
- small seeds, because the big seeds won't fit in the tweezers/would slip out of the small forceps
- It could be either size depending on the size of the forceps.
- Larger seeds are easier to pick up because they have a larger surface area.

**81 MC on scoring key**

**82 MC on scoring key**

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

Evidence: DNA

- The more similar the DNA codes of organisms are, the closer the organisms will be on the tree.

Evidence: Similar proteins

- If organisms produce several similar proteins, they are likely to be closely related and closer on the evolutionary tree.

Evidence: Amino acid sequences

- The more amino acid sequences that are the same in two organisms, the more closely related they are.

**84** [1] Allow 1 credit for 69 beats/min.

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

- The CO<sub>2</sub> level in the blood would decrease faster due to a faster pulse/heart rate.
- More blood is going to the lungs per minute for gas exchange.
- More blood is going to the muscles per minute, providing more glucose/oxygen for energy.

**The *Chart for Determining the Final Examination Score for the January 2020 Regents Examination in Living Environment* will be posted on the Department's web site at: <http://www.p12.nysed.gov/assessment/> on Tuesday, January 21, 2020. 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 2020 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		32	48	71
Key Idea 2				62, 63
Key Idea 3			45, 46	67
Appendix A (Laboratory Checklist)		31		
Standard 4				
Key Idea 1	1, 3, 5, 7, 8, 14, 18, 27	33, 34	49	
Key Idea 2	4, 6, 10, 17, 29	39	50, 51	
Key Idea 3	11, 12, 19	35, 36, 38	55	72
Key Idea 4		42, 43	53	68, 69, 70
Key Idea 5	13, 16, 23, 24, 25, 30	37, 41	47	64, 65, 66
Key Idea 6	2, 9, 20, 21, 22, 26, 28		44, 52	
Key Idea 7	15	40	54	56, 57, 58, 59, 60, 61

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