FOR TEACHERS ONLY

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

LE

LIVING ENVIRONMENT

Tuesday, June 19, 2012 — 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/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 ..... **3**	9 ..... **2**	17 ..... **4**	25 ..... **3** .....
2 ..... **4**	10 ..... **2**	18 ..... **2**	26 ..... **2** .....
3 ..... **3**	11 ..... **3**	19 ..... **2**	27 ..... **2** .....
4 ..... **1**	12 ..... **3**	20 ..... **2**	28 ..... **4** .....
5 ..... **1**	13 ..... **3**	21 ..... **1**	29 ..... **4** .....
6 ..... **4**	14 ..... **2**	22 ..... **4**	30 ..... **1** .....
7 ..... **2**	15 ..... **3**	23 ..... **1**	
8 ..... **1**	16 ..... **1**	24 ..... **1**	

Part B–1

31 ..... **2**	35 ..... **3**	39 ..... **2**	43 ..... **2** .....
32 ..... **3**	36 ..... **1**	40 ..... **4**	
33 ..... **2**	37 ..... **1**	41 ..... **3**	
34 ..... **3**	38 ..... **3**	42 ..... **4**	

Part B–2

47 ..... **4**	49 ..... **1**	50 ..... **3** .....

Part D

73 ..... **2**	75 ..... **1**	81 ..... **4** .....
74 ..... **1**	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.

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 Tuesday, June 19, 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 no longer 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

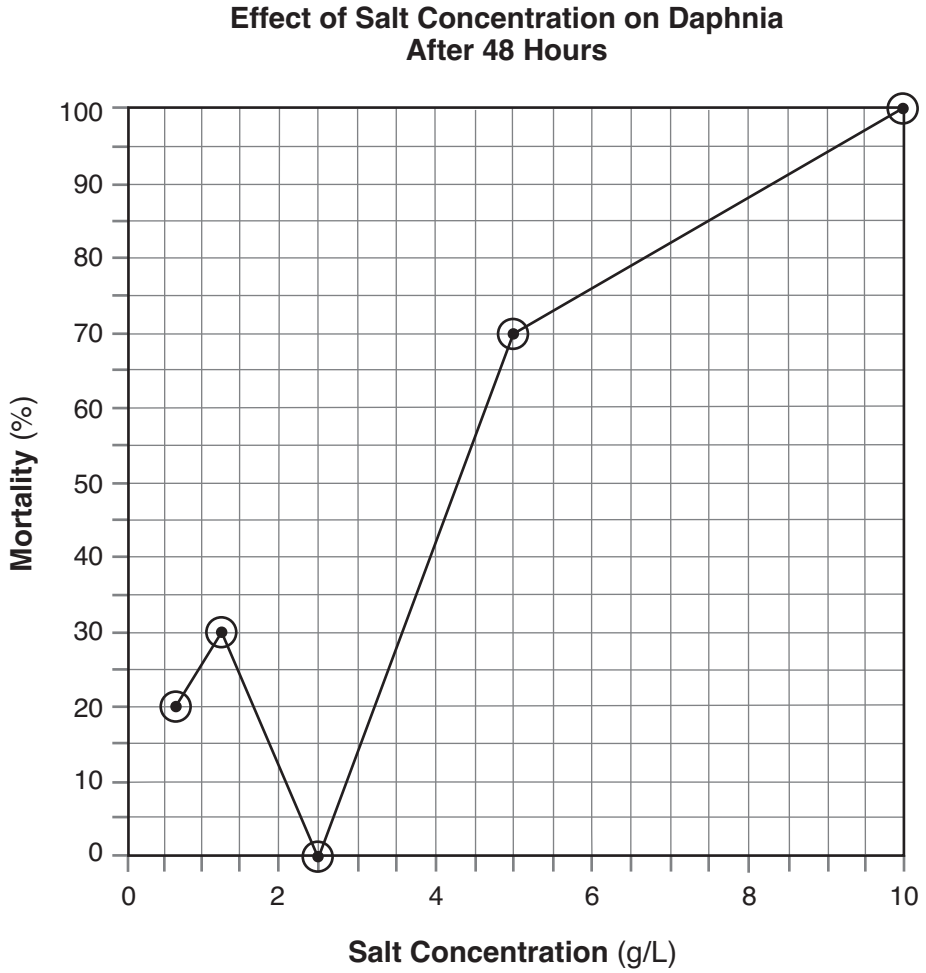
44 [1] Allow 1 credit for Salt Concentration (g/L).

Note: Do *not* allow credit for a response without the units label, g/L.

45 [1] Allow 1 credit for marking an appropriate scale, without any breaks, on each axis.

46 [1] Allow 1 credit for correctly plotting the data for mortality and connecting the points.

Example of a 3-credit graph for questions 44–46:



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 2.5 g/L and supporting the answer. Acceptable responses include, but are not limited to:

— No daphnia died at this concentration of salt.

— The most daphnia lived.

49 MC on scoring key

50 MC on scoring key

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

— do not have a cat or a dog

— lower the amount of moisture in the air in the home

— do not have carpet on the floor

— vacuum often

— clean or remove dust often

— wash bedding frequently

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

— Seven months later, there is a higher frequency in the population of the gene for resistance to the insecticide.

— Most of the mosquitoes will have the variation that protects them from the pesticide.

— More have the gene that makes them immune to the effect of the pesticide.

— More mosquitoes have the gene that allows them to survive.

53 [1] Allow 1 credit for Annelida and supporting the answer.

— They are closer to each other on the branch (tree).

— Arthropoda and Annelida share a specific common ancestor that the other organisms don't share.

54 [1] Allow 1 credit for 2 and supporting the answer. Acceptable responses include, but are not limited to:

— The population size is greater than the size of the population that the ecosystem can support.

— Because it is above its carrying capacity, the ecosystem cannot supply enough food for survival, so members of the species compete for limited food.

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

— Each species has different life requirements, and the type and number of resources in an ecosystem will influence the population sizes of species living there.

— Each species has different requirements, which affect how many organisms can be supported by the ecosystem.

— Different species occupy different niches.

Part C

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

— The control tank would not contain any fertex, while the experimental tank would contain fertex.

— The control tank would have no fertex.

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

— amount of water

— temperature of water

— salinity of water

— amount of light

— time sperm and eggs remain in water

— size of tanks

— amount of sperm

— the number of eggs

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

— increase the sample size

— repeat the experiment

— have more tanks for each concentration

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

— amount of fertex

— percent of fertex

— concentration of fertex

Note: Do *not* allow credit for just "fertex" without a quantifier.

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

— percent of fertilization in each tank over time

— number of eggs fertilized at end of experiment

— number of sea urchins that develop/grow in each tank

Note: The type of data must be measurable.

Note: The student's response to the bulleted items in question 61–63 need *not* appear in the following order.

61 [1] Allow 1 credit for identifying what is present in a vaccine that stimulates an immune response. Acceptable responses include, but are not limited to:

— dead/weakened virus/germ

— antigens

— small pieces of the virus/viral coat

Note: Do *not* allow credit for "a little bit of the disease" *or* "a small amount of the virus."

62 [1] Allow 1 credit for describing how a vaccine protects against disease. Acceptable responses include, but are not limited to:

— It causes an immune response, so that your body can respond quicker next time you are exposed to the same pathogen/organism.

— It causes the body to produce antibodies that fight the disease.

63 [1] Allow 1 credit for stating why a student vaccinated against mumps can still be infected by the pathogens that cause other diseases, such as chicken pox. Acceptable responses include, but are not limited to:

— Vaccines protect only against specific diseases.

— Antibodies are specific.

64 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— The young and old bison are more likely to perish during a harsh winter.

— More energy is used by the bison to keep warm.

— Less food is available.

65 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— It helps recycle molecules from the organic wastes.

— They prevent the buildup of human sewage.

— It prevents contamination of the water supply.

Note: The student's response to the bulleted items in question 66–68 need *not* appear in the following order.

66 [1] Allow 1 credit for stating *one* possible way the *Mimosa diplotricha* vine kills trees and shrubs. Acceptable responses include, but are not limited to:

— It kills trees and shrubs because it covers them like a blanket, cutting down on the amount of sunlight to these plants.

— It cuts down on photosynthesis.

— It outcompetes the trees for water or other nutrients.

— The vine may have roots that attach to trees and shrubs and absorb nutrients from them.

67 [1] Allow 1 credit for identifying *one* location from which the *Heteropsylla spinulosa* insect will be collected. Acceptable responses include, but are not limited to:

— Pohnpei

— Palau

— Australia

— Micronesia

68 [1] Allow 1 credit for explaining why releasing the insect might be safer than spraying chemicals to kill the vine. Acceptable responses include, but are not limited to:

— The chemicals may be harmful to people.

— The chemicals may affect other plants or animals negatively.

— Using insects does not add chemicals to the environment.

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 technique used to alter the DNA. Acceptable responses include, but are not limited to:

— genetic engineering

— genetic manipulation

— gene splicing

— forming recombinant DNA

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

70 [1] Allow 1 credit for stating *one* reason why the scientists altered the DNA of the chickens instead of altering a protein already present in the chickens. Acceptable responses include, but are not limited to:

— DNA carries the code for making the proteins.

— DNA can replicate and the code will be passed on to offspring.

— Proteins cannot be used to pass on traits.

— so the chicks will inherit the drug-producing ability

71 [1] Allow 1 credit for stating *one* advantage of using chickens for this procedure. Acceptable responses include, but are not limited to:

— They grow fast.

— They need less room than bigger animals.

— Chickens are less expensive.

— Baby chicks inherit the drug-producing ability.

72 [1] Allow 1 credit for stating *one* reason why some people may *not* support this method of drug production. Acceptable responses include, but are not limited to:

— We don't know the long-term effects of these drugs on the chickens.

— Some people think products from genetically modified organisms could be harmful.

— People with egg allergies might not be able to use these drugs.

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 small tree finch and supporting the answer. Acceptable responses include, but are not limited to:

— The small tree finch eats animals, whereas the other two birds are plant eaters.

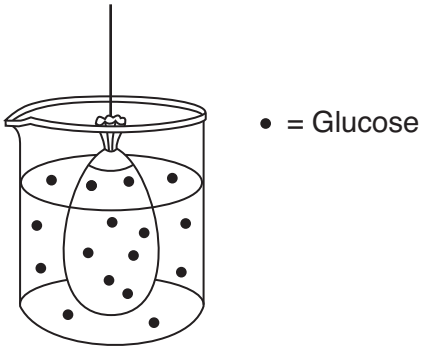
— It is the only one that eats mainly animal food.

— The small tree finch eats animals.

— Since the other two species eat plant food, not animal food, a decreased insect population will not affect them.

78 [1] Allow 1 credit for drawing the expected location of the glucose molecules after 20 minutes.

Example of a 1-credit response:



Note: The actual number of glucose molecules is not important, as long as some glucose is located both inside and outside the cell.

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

— All of the starch molecules would be in the artificial cell.

— The starch would not move out of the cell.

— The starch would stay in the cell.

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

— A stain makes some organelles more visible.

— easier to see cell parts

81 MC on scoring key

82 MC on scoring key

83 [1] Allow 1 credit for the correct amino acid sequences for species *A*.

84 [1] Allow 1 credit for the correct mRNA base sequences for species *B*.

Example of a 2-credit response for questions 83 and 84:

Plant Species Table

Endangered plant species	DNA base sequence	AAT	CCG	AGT	GGA
	mRNA base sequence	UUA	GGC	UCA	CCU
	amino acid sequence	LEU	GLY	SER	PRO
Plant species A	DNA base sequence	AAC	CCA	AGT	GGA
	mRNA base sequence	UUG	GGU	UCA	CCU
	amino acid sequence	**LEU**	**GLY**	**SER**	**PRO**
Plant species B	DNA base sequence	ATA	CCC	AGG	GGA
	mRNA base sequence	**UAU**	**GGG**	**UCC**	**CCU**
	amino acid sequence	TYR	GLY	SER	PRO
Plant species C	DNA base sequence	CAT	CCT	ATA	GGA
	mRNA base sequence	GUA	GGA	UAU	CCU
	amino acid sequence	VAL	GLY	TYR	PRO

85 [1] Allow 1 credit for *A* and supporting the answer. Acceptable responses include, but are not limited to:

— It is most closely related to the endangered species because their amino acid sequences are identical.

— It is most closely related to the endangered species because the DNA sequences are the most similar.

Note: Allow credit for a response that is consistent with the student's response to question 83.

The *Chart for Determining the Final Examination Score for the June 2012 Regents Examination in Living Environment* will be posted on the Department's web site at: http://www.p12.nysed.gov/apda/ on Tuesday, June 19, 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

June 2012 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				
Key Idea 2				56, 57, 58, 59, 60
Key Idea 3			44, 45, 46, 47	
Appendix A (Laboratory Checklist)				
Standard 4				
Key Idea 1	1, 2, 3, 4, 5, 16, 21	31, 32, 41		64
Key Idea 2	7, 8, 12, 13			69, 70, 71, 72
Key Idea 3	6, 9, 14, 15, 30	40	52, 53	
Key Idea 4	18, 19	34, 35, 38, 39		
Key Idea 5	10, 20, 24, 25	33, 37	49, 50	61, 62, 63
Key Idea 6	17, 22, 23, 26	36, 42	48, 54, 55	65
Key Idea 7	11, 27, 28, 29	43	51	66, 67, 68

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