

FOR TEACHERS ONLY

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

LE

LIVING ENVIRONMENT

Tuesday, August 16, 2005 — 12:30 to 3:30 p.m., only

SCORING KEY AND RATING GUIDE

Directions to the Teacher:

Refer to the directions on page 3 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. Visit the site <http://www.emsc.nysed.gov/osa/> and select the link "Latest Information" for any recently posted information regarding this examination. This site should be checked before the rating process for this examination begins and at least one more time before the final scores for the examination are recorded.

Part A and Part B-1

Allow 1 credit for each correct response.

Part A			Part B-1	
14	113	211	312	361
21	124	224	324	372
34	131	232	333	384
43	144	243	341	393
51	151	251	353	404
64	162	261		
71	174	272		
82	183	282		
94	192	293		
103	202	303		

LIVING ENVIRONMENT – *continued*

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*.

Use only *red* ink or *red* pencil in rating Regents papers. Do not attempt to *correct* the student's work by making insertions or changes of any kind.

Allow 1 credit for each correct response for multiple-choice questions.

On the detachable answer sheet for Part A and Part B–1, indicate by means of a checkmark each incorrect or omitted answer to multiple-choice questions. In the box provided in the upper right corner of the answer sheet, record the number of questions the student answered correctly for each of these parts.

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 all 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. In the student's examination booklet, record the number of credits earned for each answer in the box printed to the right of the answer lines or spaces for that question.

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.

Raters should enter the scores earned for Part A, Part B–1, Part B–2, Part C, and Part D on the appropriate lines in the box printed on the answer sheet and should add these 5 scores and enter the total in the box labeled "Total Raw Score." Then the student's raw score should be converted to a scaled score by using the conversion chart that will be posted on the Department's web site <http://www.emsc.nysed.gov/osa/> on Tuesday, August 16, 2005. The student's scaled score should be entered in the box labeled "Final Score" on the student's answer booklet. The scaled score is the student's final examination score.

All student answer papers that receive a scaled score of 60 through 64 **must** be scored a second time. For the second scoring, a different committee of teachers may score the student's paper or the original committee may score the paper, except that no teacher may score the same open-ended questions that he/she scored in the first rating of the paper. The school principal is responsible for assuring that the student's final examination score is based on a fair, accurate, and reliable scoring of the student's answer paper.

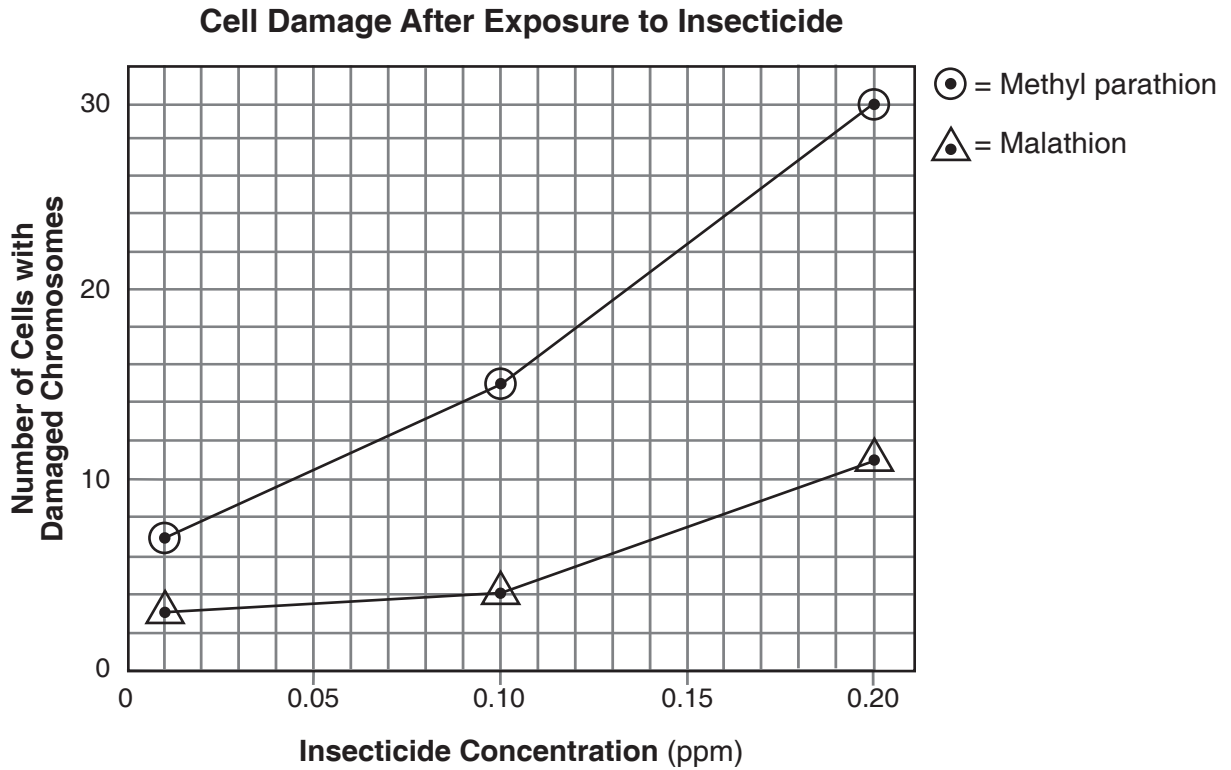
Because scaled scores corresponding to raw scores in the conversion chart may change from one examination to another, it is crucial that for each administration, the conversion chart provided for that administration be used to determine the student's final score.

Part B-2

- 41** Allow 1 credit for indicating that as the beaver population increases, the number of aspen trees decreases.
- 42** Allow 1 credit for stating one possible reason for the relationship. Acceptable responses include, but are not limited to:
- The beavers use the trees for food.
 - This occurs because the beavers use the trees for shelter.
 - Beavers use the trees to build dams.
- 43** Allow 1 credit for predicting how the number of aspen trees would change if a parasite that targets the beaver population were introduced into the area during year 5 and for explaining the prediction. Acceptable responses include, but are not limited to:
- The parasite might cause a decrease in the beaver population and there would be more aspen trees.
 - The number of aspen trees would increase because the parasites would weaken the beavers.
 - The parasite might not affect the beaver population and the number of trees would not change.
- 44** Allow 1 credit for marking an appropriate scale on the axis labeled “Number of Cells with Damaged Chromosomes.”
- 45** Allow 1 credit for plotting the data for methyl parathion correctly, surrounding each point with a small circle and connecting the points.
- Note:** Points must be circled to receive credit.
- 46** Allow 1 credit for plotting the data for malathion correctly, surrounding each point with a small triangle and connecting the points.

Note: Points must be within the triangles to receive credit.

Example of a 3-Credit Graph



- 47 Allow 1 credit for stating that methyl parathion has a more damaging effect on chromosomes and supporting the answer. Acceptable responses include, but are not limited to:
- Methyl parathion; the line on the graph is higher than for malathion.
 - At .2 ppm methyl parathion damaged chromosomes in 30 cells and malathion damaged chromosomes in only 11.
 - The data table shows more chromosome damage from methyl parathion at every concentration.
- 48 Allow 1 credit for stating one specific way white blood cells help to protect the human body from pathogens. Acceptable responses include, but are not limited to:
- by engulfing invaders
 - by producing antibodies
 - by marking invaders for killing

Note: Do *not* allow credit for simply indicating that white blood cells fight disease.

LIVING ENVIRONMENT – *continued*

49 Allow a maximum of 2 credits, 1 credit for each system identified with a correct description of how it is involved in maintaining glucose levels in the blood. Acceptable responses include, but are not limited to:

- circulatory—carries insulin from pancreas throughout body
- digestive—absorbs sugar from digested food
- endocrine—makes hormones that regulate sugar level

50 2

51 Allow 1 credit for stating why many species of cichlids survived while others became extinct. Acceptable responses include, but are not limited to:

- Some species are better adapted to the environment.
- Some species have a greater ability to compete for food *or* escape predators *or* breed.
- natural selection

52 Allow 1 credit for stating one reason for the genetic differences. Acceptable responses include, but are not limited to:

- evolution
- meiosis
- sexual reproduction
- recombination during fertilization
- crossing-over
- mutations
- natural selection / isolation

53 Allow 1 credit for stating what ecological problem most likely caused the earlier melting of the ice fields in the Hudson Bay area of Canada. Acceptable responses include, but are not limited to:

- Global warming is most likely responsible.
- greenhouse effect
- too much carbon dioxide in the atmosphere

54 Allow 1 credit for stating one specific long-term action that humans could take that might slow down or reduce the melting of the ice fields. Acceptable responses include, but are not limited to:

- burn less fossil fuel
- replant trees as existing ones are cut down
- limit the number of trees cut down

Part C

55 Allow a maximum of 4 credits for designing an experiment to test the effectiveness of bosentan as a drug to treat high blood pressure in the lungs, allocated as follows:

- Allow 1 credit for stating the hypothesis the experiment will test. Acceptable responses include, but are not limited to:
 - Bosentan treatment improves the lung function of people with high blood pressure in the lungs.
 - Treatment with bosentan will decrease a patient’s blood pressure in the lungs.
 - Treatment with bosentan will increase a patient’s ability to walk without fatigue.
 - Bosentan can be used to treat high blood pressure in the lungs.

- Allow 1 credit for stating how the control group will be treated differently from the experimental group. Acceptable responses include, but are not limited to:
 - The control group will not receive bosentan.
 - The control group will be given a placebo (or sugar pill).

- Allow 1 credit for stating *two* factors that must be kept the same in both the experimental and control groups. Acceptable responses include, but are not limited to:
 - same number of males and females
 - similar activities for the 12 weeks
 - initial high pulmonary blood pressure
 - same size pill, given at the same time
 - similar food, sleep time, etc.
 - same range of ages

- Allow 1 credit for stating the type of data that should be collected to determine if the hypothesis is supported. Acceptable responses include, but are not limited to:
 - Record the initial pulmonary blood pressure in each group. Once a week record the pulmonary blood pressure of each group.
 - See which individuals can walk the longest without fatigue after treatment begins and compare this to how long they could walk without fatigue prior to treatment.

56 Allow a maximum of 3 credits allocated as follows:

- Allow 1 credit for identifying a place in the human body where diffusion takes place (e.g., small intestine *or* digestive system).
- Allow 1 credit for identifying a substance that diffuses there (e.g., simple sugar *or* amino acid *or* digested food).
- Allow 1 credit for identifying where that substance diffuses from and where it diffuses to, at that place (e.g., simple sugar diffuses from the inside of the small intestine into the blood).

57 Allow 1 credit for stating what this information suggests to a person who is concerned about health and is deciding on whether to have a plant-rich or animal-rich diet, and supporting the answer. Acceptable responses include, but are not limited to:

- A plant-rich diet would contain less pesticide than an animal-rich diet because producers contain less pesticide than consumers.
- A plant-rich diet is better because plants have lower concentrations of pesticides than animals.

58 Allow 1 credit for stating one way one of the activities could harm the ecosystem. Acceptable responses include, but are not limited to:

- Mining (logging) could destroy habitats.
- Overhunting (overfishing) could disrupt food chains.
- Oil drilling could pollute the ecosystem.

59 Allow 1 credit for stating one way allowing the activity chosen could benefit society. Acceptable responses include, but are not limited to:

- Logging could help prevent forest fires.
- Mining (oil drilling) would give our society more of the minerals (energy sources) it needs to function.
- Hunting could reduce car-deer accidents.

- 60** Allow a maximum of 3 credits for explaining how a new variety of wheat with disease resistance and high nutrient value could be developed, allocated as follows:
- Allow 1 credit for identifying one technique that could be used to combine disease resistance and high nutrient value in a new variety of wheat. Acceptable responses include, but are not limited to:
 - genetic engineering
 - selective breeding (cross-pollinating)
 - Allow 1 credit for describing how this technique would be carried out to produce a wheat plant with the desired characteristics. Acceptable responses include, but are not limited to:
 - Genetic engineering involves moving the genes for one of the desired traits into a plant with the other desired trait.
Note: The student must specifically state that a gene (DNA) for a desired trait is moved.
 - Selective breeding (cross-pollinating) involves mating plants with one desired characteristic with plants with the other desired characteristic.
 - Allow 1 credit for describing one specific difficulty (other than stating that it does not always work) in developing a new variety using this technique. Acceptable responses include, but are not limited to:
 - The moved gene may not be expressed.
 - It is difficult to isolate the gene.
 - The trait may be recessive.
 - There may be unintended adverse qualities.

61 Allow a maximum of 4 credits, allocated as follows:

- Allow a maximum of 2 credits, 1 credit for each of two organelles named and correctly paired with a specific process involving chemical reactions that occur there.
- Allow a maximum of 2 credits, 1 credit for correctly describing one specific way each process identified is important to the functioning of the organism. Acceptable responses include, but are not limited to:

Organelle	Process Involving Chemical Reactions that Occur in the Organelle	How the Process is Important to the Functioning of the Organism
mitochondrion	respiration	provides energy for life functions
chloroplast	photosynthesis	provides food for plant
ribosome	protein synthesis	makes structural molecules (or chemical messengers which control cell responses)
nucleus	mitosis <i>or</i> meiosis <i>or</i> DNA replication	reproduction

Part D

- 62** Allow 1 credit for identifying one substance that could have been added to the cells on the slide in view *A* that would make them resemble the cells observed in view *B*. Acceptable responses include, but are not limited to:
- salt solution
 - sugar solution
- 63** Allow 1 credit for water.
- 64** Allow 1 credit for showing more cells than in the original view, each smaller in size, with shrunken contents.
- 65** Allow 1 credit for stating one reason for using a new toothpick for the filtrate from each plant. Acceptable responses include, but are not limited to:
- prevents contamination of the different filtrates
 - to keep the filtrates separate
- 66** Allow 1 credit for stating one way the four strips would most likely be different from each other after being removed from the beakers. Acceptable responses include, but are not limited to:
- There would be different combinations of colors.
 - There would be different amounts of the different colors.
- 67** Allow 1 credit for stating how a comparison of these resulting strips could indicate evolutionary relationships. Acceptable responses include, but are not limited to:
- The more similar the patterns of colors, the closer the relationships.
 - The more similar the number of colors (and relative amounts of color), the closer the relationships.
- 68** 3
- 69** Allow 1 credit for stating that the graph does *not* support the conclusion, and for justifying the answer. Acceptable responses include, but are not limited to:
- No, the results for females were higher than for males after walking.
 - No, the results in the graph are averages of all the males and all the females. Some males could have much lower rates or some females could have much higher rates.
 - No, the relative numbers of males and females were not graphed. It could have been 1 male and 27 females.
 - No, the sample size is too small to support this conclusion.

LIVING ENVIRONMENT – *concluded*

70 Allow a maximum of 2 credits, 1 credit for identifying two birds that would most likely compete for food in times of food shortage and 1 credit for explaining why they would compete. Acceptable responses include, but are not limited to:

- Medium and large ground finches both have crushing bills and eat plants.
- Small tree finch and large tree finch would compete because both eat mainly animals.
- Large ground finch and sharp-billed ground finch have similar beaks and eat mainly plant food.

71 2

72 4

73 2

The *Chart for Determining the Final Examination Score for the August 2005 Regents Examination in Living Environment* will be posted on the Department's web site <http://www.emsc.nysed.gov/osa> on Tuesday, August 16, 2005. 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.

Map to Core Curriculum

August 2005 Living Environment

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

Part D 62–73	
Lab 1	65,66,67,73
Lab 2	68,69
Lab 3	70,71,72
Lab 5	62,63,64