

FOR TEACHERS ONLY

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

LE

LIVING ENVIRONMENT

Friday, June 18, 2004 — 1:15 to 4:15 p.m., only

SCORING KEY AND RATING GUIDE

Directions to the Teacher:

Refer to the directions on page 3 before rating student papers.

Part A and Part B-1

Allow one credit for each correct answer.

Part A						Part B-1			
1	2	11	2	21	2	31	1	36	4
2	3	12	3	22	2	32	3	37	2
3	1	13	4	23	3	33	2	38	3
4	3	14	4	24	4	34	4	39	1
5	2	15	1	25	3	35	1	40	3
6	4	16	4	26	2				
7	1	17	1	27	1				
8	3	18	4	28	3				
9	1	19	2	29	4				
10	2	20	2	30	4				

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.

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 Administering and 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 Friday, June 18, 2004. 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 a maximum of 2 credits, 1 credit for completing space *A* and 1 credit for completing space *B*.

Examples of 2-Credit Responses

<i>A</i> Lung	<i>B</i> oxygen
<i>A</i> Small intestine	<i>B</i> glucose
<i>A</i> Large intestine	<i>B</i> water

- 42 Allow 1 credit for a correct term or phrase that letter *X* most likely represents in the diagram. Acceptable responses include, but are not limited to:

- homeostasis
- dynamic equilibrium
- steady state
- coordination
- regulation
- human body
- heart

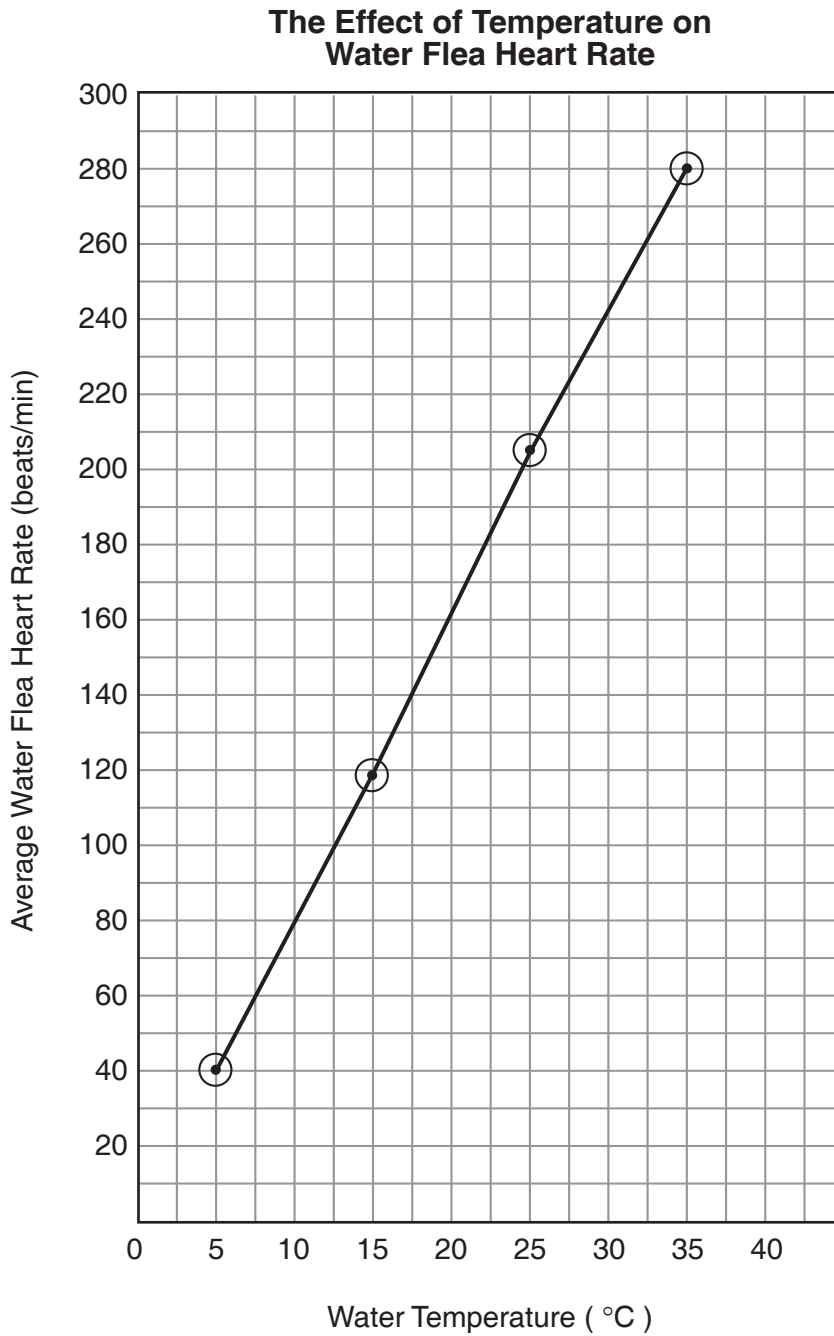
- 43 Allow 1 credit for marking an appropriate scale on each labeled axis.

Note: Make no assumptions about the origin unless it is labeled.

- 44 Allow 1 credit for plotting the data for the average heart rate correctly (based on the student's axes), surrounding each point with a small circle, and connecting the points.

Note: Credit may be allowed if the points are plotted correctly but not circled.

Example of a 2-Credit Graph



45 3

46 Allow 1 credit for stating the relationship between temperature and heart rate in water fleas. Acceptable responses include, but are not limited to:

- As the temperature increases, the heart rate increases.
- As temperature changes from 35°C to 5°C, heart rate in the water flea decreases.

47 3

48 Allow 1 credit for **rabbit** *or* **grasshopper** *or* **deer**.

49 Allow 1 credit for **trees** *or* **grass**.

50 3

51 Allow 1 credit for identifying one environmental factor that could cause a base sequence in DNA to be changed to a different base sequence. Acceptable responses include, but are not limited to:

- ultraviolet light
- radiation
- x rays
- chemicals

52 Allow 1 credit for describing how a protein would be changed if a base sequence mutates from GGA to TGA. Acceptable responses include, but are not limited to:

- The shape of the protein may be changed.
- The amino acid sequence would be different.
- The protein would contain threonine instead of proline.
- The protein being synthesized may not work correctly.
- The protein will not be able to function.

53 Allow 1 credit for identifying a label that could appropriately be used to replace letter Z on the axis. Acceptable responses include, but are not limited to:

- temperature
- pH
- time

54 Allow 1 credit for explaining why removing the dead cornstalks reduced corn production in these fields. Acceptable responses include, but are not limited to:

- Materials are not recycled.
- Soil minerals decrease.

Part C

- 55** Allow 1 credit for stating one possible negative effect of passing a law to reduce the release of toxic chemicals. Acceptable responses include, but are not limited to:
- Products will cost more money.
 - Jobs may be lost.
 - Businesses may move to states with fewer restrictions.
 - Tax revenues could be lost.
- 56** Allow 1 credit for stating one possible explanation for why the amount of toxic chemicals released remained relatively constant between 1995 and 1997. Acceptable responses include, but are not limited to:
- The laws had been in place long enough for businesses to reduce toxic chemical output to the lowest possible levels.
 - The laws may have set 20 million pounds as an acceptable limit.
 - stricter law enforcement
- 57** Allow 1 credit for identifying one other type of environmental problem that has been reduced by passing laws. Acceptable responses include, but are not limited to:
- pollution
 - endangered wildlife
 - landfills
 - poor air quality
 - litter

- 58 Allow a maximum of 6 credits for a brief explanation of some of the steps in the process of human development, allocated as follows:
- Allow 1 credit for explaining how a zygote is formed. Acceptable responses include, but are not limited to:
 - Gametes fuse.
 - Fertilization occurs.
 - Sperm and egg fuse.
 - Allow 1 credit for comparing the genetic content of the zygote to that of a body cell of the parents. Acceptable responses include, but are not limited to:
 - The zygote is not genetically identical to a body cell of either parent.
 - The zygote has the same chromosome number as a body cell of the parents.
 - Half of the zygote’s chromosomes come from each parent.
 - Allow 1 credit for identifying one developmental process involved in the change from a zygote into an embryo. Acceptable responses include, but are not limited to:
 - differentiation
 - mitosis
 - cell division
 - cleavage
 - Allow 1 credit for **uterus**.
 - Allow a maximum of 2 credits, 1 credit for each of two factors that can affect fetal development and an explanation of how each factor affects fetal development. Acceptable responses include, but are not limited to:
 - Alcohol can affect development of the brain.
 - Smoking can result in premature births/low birth weight.
 - Crack can cause the placenta to separate prematurely resulting in brain damage or death.
 - Malnutrition in the mother can result in low birth weight.
 - Genes will affect how the baby develops.
 - The amnion provides a watery environment and protection.
 - Good nutrition by the mother favors healthy development.

58 continued

Example of a 6-Credit Response

- In humans, when the male and female gametes fuse, a zygote is formed. This process is fertilization and the result is a cell with the same amount of genetic information as a body cell of the parents. The zygote will develop into an embryo by the processes of mitosis and differentiation. Most fetal development occurs in the uterus. Many factors affect development. If the genetic information is incomplete or faulty, the embryo may not develop correctly or may die. The environment is also very important. X rays can cause mutations and alcohol can result in brain damage.

59 Allow a maximum of 5 credits for describing the nature of AIDS and identifying two ways to prevent or control the spread of infectious diseases, such as AIDS, allocated as follows:

- Allow 1 credit for indicating that AIDS is caused by a virus.
- Allow 1 credit for indicating that the virus attacks the immune system of the body.
- Allow 1 credit for indicating that when the immune system is weakened, the body is less able to defend itself from other infections or cancer than the body would often be able to overcome.
- Allow a maximum of 2 credits, 1 credit for each of two ways to prevent or control the spread of infectious diseases, such as AIDS. Acceptable responses include, but are not limited to:
 - good hygiene
 - vaccination
 - Avoid transfer of body fluids from sexual contact.
 - Avoid sharing of needles used for injection of drugs.
 - antibody injections

- 60** Allow a maximum of 3 credits for explaining what the problem of loss of biodiversity is and describing some ways humans are involved in both the problem and the possible solutions, allocated as follows:
- Allow 1 credit for stating the meaning of the term biodiversity. Acceptable responses include, but are not limited to:
 - Biodiversity means many different species live in a particular habitat.
 - A particular habitat has much variation in the types of organisms found there.
 - Allow 1 credit for stating one negative effect on humans if biodiversity continues to be lost. Acceptable responses include, but are not limited to:
 - Lost organisms may have possible medical use.
 - Genes from lost organisms are not available to use for development of new varieties of organisms.
 - disruption of food chains
 - Allow 1 credit for suggesting one practice that could be used to preserve biodiversity in New York State. Acceptable responses include, but are not limited to:
 - laws that protect habitat
 - setting aside of wilderness areas
 - hunting and fishing laws
 - reducing pollution

Example of a 3-Credit Response

- Biodiversity is present when a habitat has a wide variety of species living there. Continued loss of biodiversity could result in loss of species that may have genetic information we could use to treat human diseases or engineer into farm animals or crops. A law that protects a large forest or wetland area from development would allow the species there to remain undisturbed.

Part D

- 61** Allow a maximum of 2 credits, 1 credit for indicating that bears 1 and 3 are most closely related and 1 credit for indicating that they have more DNA bands (4) in common.
- 62** Allow 1 credit for identifying one additional way to determine the evolutionary relationship of these bears. Acceptable responses include, but are not limited to:
- Compare proteins from the bears.
 - Compare embryonic similarities.
 - Compare structural similarities.

Note: Do not allow credit for comparison of life functions or habitats.

63 1

- 64** Allow 1 credit for identifying one procedure, other than electrophoresis, that is used in the laboratory to separate the different types of molecules in a liquid mixture. Acceptable responses include, but are not limited to:
- chromatography
 - centrifugation
 - diffusion through a membrane
 - filtering

65 Allow a maximum of 6 credits for describing a controlled experiment to test the claim, allocated as follows:

- Allow 1 credit for stating the purpose of the experiment. Acceptable responses include, but are not limited to:
 - Determine if exercise improves the rate at which math problems are solved.
 - Test the guest’s claim.

Note: Credit may be given if time/rate is not mentioned in the purpose but is addressed in the other parts of the response.

- Allow 1 credit for indicating that a large sample size will increase the validity/reliability of the experiment.
- Allow a maximum of 2 credits, 1 credit for indicating that one group (the experimental group) will exercise and 1 credit for indicating that the other group (the control group) will not exercise.
- Allow 1 credit for stating the specific data to be collected during the experiment. Acceptable responses include, but are not limited to:
 - speed of solving math problems
 - number of math problems solved in a certain amount of time
 - how fast math problems can be solved
- Allow 1 credit for stating one way to determine if the results support the claim. Acceptable responses include, but are not limited to:
 - See if the experimental group solves math problems more rapidly than the control group.
 - Compare the number of math problems solved by the experimental and control groups in a given time period.

66 1

67 2

Regents Examination in Living Environment

June 2004

**Chart for Converting Total Test Raw Scores to
Final Examination Scores (Scaled Scores)**

The *Chart for Determining the Final Examination Score for the June 2004 Regents Examination in Living Environment*, normally located on this page, will be posted on the Department's web site <http://www.emsc.nysed.gov/osa> on Friday, June 18, 2004. 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

June 2004 Living Environment

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

Part D 61-67	
Lab 1	61,62,63,64
Lab 2	65,66
Lab 5	67