FOR TEACHERS ONLY

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

LE

LIVING ENVIRONMENT

Wednesday, June 22, 2005 — 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 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

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

Part B–1

31 . . . . **2**	35 . . . . **1**
32 . . . . **4**	36 . . . . **4**
33 . . . . **3**	37 . . . . **3**
34 . . . . **3**	38 . . . . **1**

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 Wednesday, June 22, 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

39 Allow 1 credit for explaining why sexually produced offspring resemble, but are not identical to, either parent. Acceptable responses include, but are not limited to:

— Offspring receive only half their genes (*or* DNA *or* chromosomes *or* genetic information) from each parent.
— They receive some genes from each parent.

40 Allow 1 credit for explaining why these genetically identical cells can differ in structure and function. Acceptable responses include, but are not limited to:

— Different parts of genetic information are used in different cells.
— Different cells are influenced by their environments in the body.

41 Allow 1 credit for stating one biological reason that this imported insect is a more serious problem for the trees than other insects that have been present in the area for hundreds of years. Acceptable responses include, but are not limited to:

— The gypsy moth has no natural enemies in this area.
— The insect probably has no natural enemies in its new environment, allowing it to overpopulate and become a greater pest than if predators had kept its numbers in check.
— Oak trees have adapted to the pests that have been in their environment for a long time, but have not yet adapted to this new pest organism.

42 Allow 1 credit for explaining how sterilizing male insects with x rays reduces the survival of this insect species. Acceptable responses include, but are not limited to:

— If sperm production stops, then eggs cannot be fertilized.
— It reduces genetic variation by limiting the number of males that can produce offspring.
— Without reproduction no species can survive.

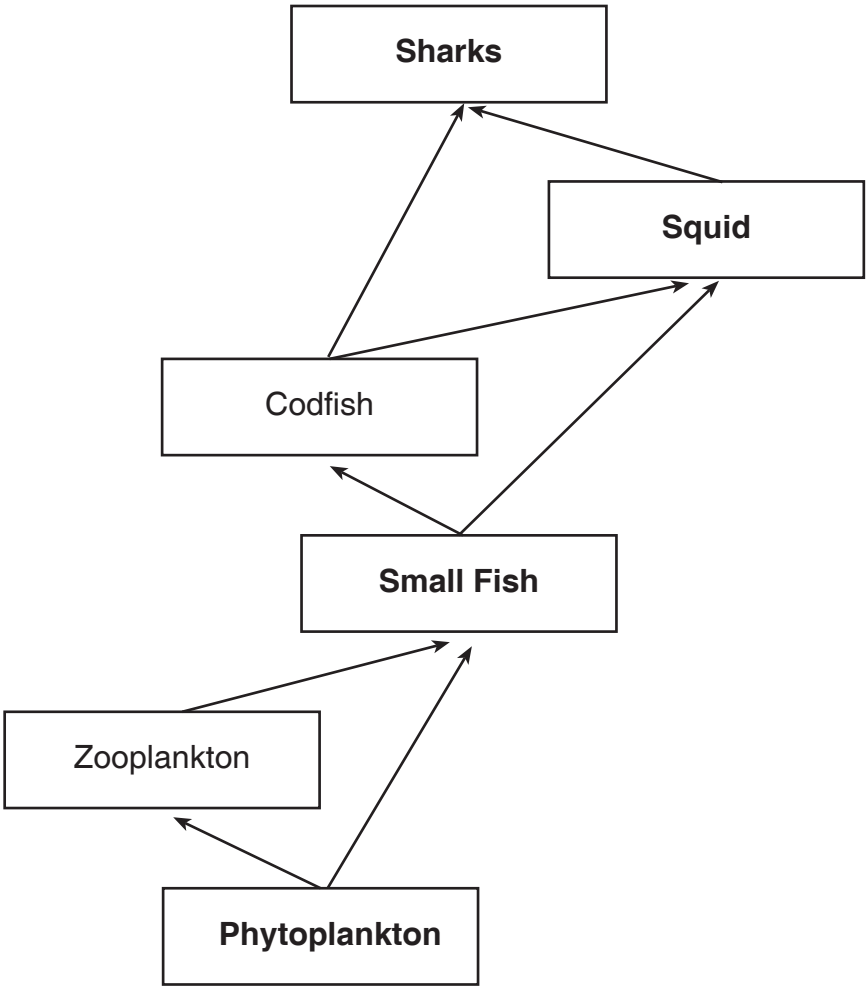
43 Allow 1 credit for explaining why overfishing codfish in the North Atlantic could endanger both the shark population and the squid population in this community. Acceptable responses include, but are not limited to:

— Both of these animals depend on codfish as a source of food.

44 Allow 1 credit for small fish.

45 Allow 1 credit for completing the food web by placing the names of the organisms in the correct locations.

Example of an Appropriate Response



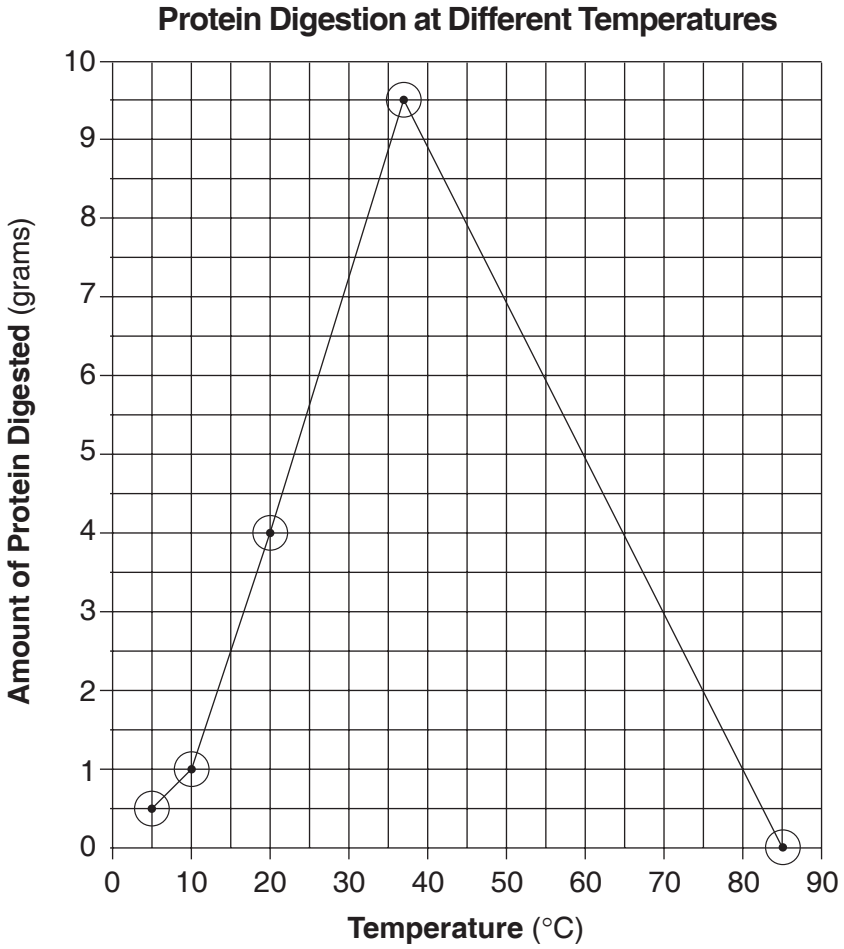
46 4

47 Allow 1 credit for marking an appropriate scale on each axis.

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

48 Allow 1 credit for plotting the data correctly (based on the student's scaled axes), surrounding each point with a small circle and connecting the points. Allow credit even if the points are *not* circled.

Example of a 2-Credit Graph



49 3

50 Allow 1 credit for explaining why no starch was digested. Acceptable responses include, but are not limited to:

— The enzyme in stomach fluid will not digest starch.
— The enzyme in stomach fluid is specific for protein digestion.

51 1

52 1

53 2

54 Allow 1 credit for explaining why stimulation of seed growth by allelochemicals at inappropriate times of the year is considered a disadvantage. Acceptable responses include, but are not limited to:

— If seed germination is stimulated in the fall season for seeds that normally germinate in the spring, the growing season will not be long enough for the plants to mature.
— If the seed grows at the wrong time, growing conditions may not be right.

55 Allow 1 credit for stating one possible use of allelochemicals in agriculture. Acceptable responses include, but are not limited to:

— Allelochemicals may be used as a new method to control weeds.
— Allelochemicals can stimulate seed germination.

Part C

56 Allow a maximum of 4 credits for discussing the immune response to the chicken pox virus, allocated as follows:

- Allow 1 credit for stating the role of antigens in the immune response. Acceptable responses include, but are not limited to:

  — Antigens stimulate the immune response.
  — Antigens on the chicken pox virus are recognized by the person's immune system and it responds by producing antibodies.

- Allow 1 credit for stating the role of white blood cells in the body's response to the virus. Acceptable responses include, but are not limited to:

  — White blood cells attack and destroy the virus.
  — White blood cells are able to recognize foreign antigens.
  — White blood cells make antibodies against the virus.

- Allow 1 credit for explaining why recovery from an infection with the chicken pox virus will not protect a person from getting a different disease, such as measles. Acceptable responses include, but are not limited to:

  — These antibodies are specific for the chicken pox virus.
  — The antibodies the body makes against the chicken pox antigens (or virus) have specific shapes that only work against the antigens on the chicken pox virus, not the measles virus, because their antigens are shaped differently.

- Allow 1 credit for explaining why a chicken pox vaccination usually does not cause a person to become ill with chicken pox. Acceptable responses include, but are not limited to:

  — A vaccine contains weakened virus.
  — A vaccine usually consists of a dead or weakened form of the disease organism that stimulates the production of antibodies without causing the disease.

57 Allow a maximum of 4 credits for designing an experiment to test the prediction "Garlic grows better as the salt concentration of the solution in which it is grown increases," allocated as follows:

- Allow 1 credit for describing the control as a garlic bulb grown in (distilled) water.

- Allow 1 credit for describing the difference between the three experimental groups. Acceptable responses include, but are not limited to:

  — Each experimental group would have a different concentration of salt solution.

- Allow 1 credit for stating one type of measurement that should be made to determine if the prediction is accurate. Acceptable responses include, but are not limited to:

  — the length of the leaf in each group
  — the length of the roots in each group
  — the number of roots in each group

- Allow 1 credit for describing one example of experimental results that would support the prediction. Acceptable responses include, but are not limited to:

  — There is an increase in the length of the leaves as the salt concentration increases.
  — There is an increase in the length of the roots as the salt concentration increases.
  — More salt results in more roots.

58 Allow a maximum of 4 credits for discussing the overall relationship between carbon dioxide concentration and changes in atmospheric temperature and the effect of these factors on ecosystems, allocated as follows:

- Allow 1 credit for indicating that as CO_2 increases, the atmospheric temperature increases.

- Allow 1 credit for stating one way in which humans have contributed to the increase in atmospheric carbon dioxide. Acceptable responses include, but are not limited to:

  — deforestation
  — combustion
  — increasing human population

  Note: Do *not* allow credit for pollution unless a specific source of pollution is mentioned.

- Allow 1 credit for stating one specific negative effect the continued rise in temperature would be likely to have on an ecosystem. Acceptable responses include, but are not limited to:

  — Increased ocean temperatures will destroy fish.
  — Polar ice could melt and flood land.
  — may cause extinction of organisms
  — may cause change in population numbers

- Allow 1 credit for stating one example of how humans are trying to reduce the problem of global warming. Acceptable responses include, but are not limited to:

  — plant more trees
  — reduce the use of fossil fuels
  — use alternative energy sources
  — carpool
  — recycling

59 Allow a maximum of 2 credits, 1 credit for each part of the cycle explaining how oxygen is cycled between organisms in this ecosystem. Acceptable 2-credit responses include, but are not limited to:

— It is given off by plants and used by animals (plants and/or decomposers).
— Oxygen is given off as a result of photosynthesis and used for respiration.

60 Allow 1 credit for describing one specific way the fish population changes the amount of one specific abiotic factor (other than oxygen) in this ecosystem. Acceptable responses include, but are not limited to:

— Fish release CO_2.
— Fish release nitrogenous waste products.

61 Allow 1 credit for identifying one source of food for the decomposers in this ecosystem. Acceptable responses include, but are not limited to:

— dead animals(plants)
— wastes of the organisms

62 Allow 1 credit for describing one specific way the use of this food by the decomposers would benefit the other organisms in the aquarium. Acceptable responses include, but are not limited to:

— Decomposers return basic materials such as nitrates and carbon dioxide to the ecosystem for reuse by other organisms.
— Decomposers recycle nutrients.

Part D

63 4

64 2

65 1

66 Allow 1 credit for explaining how increased blood flow helps muscle cells release more energy. Acceptable responses include, but are not limited to:

— supplies additional oxygen
— supplies additional nutrients
— eliminates wastes faster

67 Allow 1 credit for stating one factor that influences which molecules can pass through the cell membrane of a human cell. Acceptable responses include, but are not limited to:

— molecule size
— concentration of molecules
— pore size
— carrier proteins
— molecule charge/shape

68 Allow 1 credit for stating one way, other than the presence or absence of protein, that the two solutions may differ after the indicator has been added to both. Acceptable responses include, but are not limited to:

— The two solutions may be different colors after the indicator is added.
— One solution will produce a visible reaction; the other will not.

69 2

70 Allow 1 credit for stating what is responsible for the movement of the DNA fragments. Acceptable responses include, but are not limited to:

— electric current
— attraction of negative fragments to positive pole
— charges on the DNA

71 Allow 1 credit for explaining how it is evident from the results shown in the diagram that the samples were taken from four different individuals. Acceptable responses include, but are not limited to:

— The bands are in different positions in each column.
— different banding patterns
— different number of bands

72 Allow 1 credit for identifying the substance as enzymes *or* restriction enzymes *or* enzymes that cut DNA.

73 Allow 1 credit for showing a shaded area that is larger than the shaded area in diagram *A*.

74 3

75 1

The *Chart for Determining the Final Examination Score for the June 2005 Regents Examination in Living Environment* will be posted on the Department's web site http://www.emsc.nysed.gov/osa on Wednesday, June 22, 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

June 2005 Living Environment

Standards	Question Numbers			
	Part A 1–30	Part B–1 31–38	Part B–2 39–55	Part C 56–62
Standard 1 — Analysis, Inquiry and Design				
Key Idea 1	15	35		
Key Idea 2	1	31		
Key Idea 3			47,48,49,53,55	
Appendix A (Laboratory Checklist)			46	57
Standard 4				
Key Idea 1	2,3	33	51,52,54	59,60,61,62
Key Idea 2	4,5,6,7,8,16		39,40	
Key Idea 3	9,10,11,12	37		
Key Idea 4	13,14,18,30	38	42	
Key Idea 5	17,19,20,21,22,23	32,36	50	56
Key Idea 6	25,26,28		43,44,45	
Key Idea 7	24,27,29	34	41	58

Part D 63–75	
Lab 1	63,64,65,69,70,71,72
Lab 2	66
Lab 3	74,75
Lab 5	67,68,73